RDR-HX900

RMT-D206A

SERVICE MANUAL

US Model

Self Diagnosis Supported model

SPECIFICATIONS

System

Laser: Semiconductor laser
Channel coverage:
NTSC
VHF: 2 to 13/UHF: 14 to 69/CATV: A-8 to A-1, A to W, W+1 to W+84
Video reception: Frequency synthesizer system
Audio reception: Split carrier system
Antenna: 75-ohm antenna terminal for VHF/UHF
Timer: Clock: Quartz locked/Timer indication: 12-hour cycle (digital)/Power back-up duration: 1 hour
Video recording format: MPEG Video
Audio recording format/applicable bit rate: Dolby Digital, 2 ch/256 kbps

When you play PCM sound tracks with a 96 kHz sampling frequency, the output signals from the DIGITAL OUT (OPTICAL or COAXIAL) jack are converted to 48 kHz sampling frequency.

Inputs

(**Jack name:** Jack type/input level/input impedance)
LINE IN 1/2/3
(AUDIO): Phono jack/2 Vrms/more than 22 kilohms
(VIDEO): Phono jack/1.0 Vp-p
(S VIDEO): 4-pin mini DIN/Y:1.0 Vp-p, C: 0.286 Vp-p
DV IN: 4-pin/i.LINK S100
COMPONENT VIDEO IN (Y, P_B, P_R): Phono jack/Y: 1.0 Vp-p/P_B/P_R: interlace*=0.648 Vp-p, interlace**=0.7 Vp-p
* "Y/Pb/Pr In Black Level" is "On"
** "Y/Pb/Pr In Black Level" is "Off"
CONTROL S IN: Mini jack

Outputs

(**Jack name:** Jack type/output level/output impedance)
LINE OUT 1/2
(AUDIO): Phono jack/2 Vrms/10 kilohms
(VIDEO): Phono jack/1.0 Vp-p
(S VIDEO): 4-pin mini DIN/Y:1.0 Vp-p, C: 0.286 Vp-p
DIGITAL OUT (OPTICAL): Optical output jack/–18 dBm (wave length: 660 nm)
DIGITAL OUT (COAXIAL): Phono jack/0.5 Vp-p/75 ohms
COMPONENT VIDEO OUT (Y, P_B, P_R): Phono jack/Y: 1.0 Vp-p/P_B, P_R: interlace*=0.648 Vp-p, progressive or interlace**=0.7 Vp-p
* "Y/Pb/Pr Out Black Level" is "On"
** "Y/Pb/Pr Out Black Level" is "Off"
SET TOP BOX CONTROL: Mini jack

General

Power requirements: 120 V AC, 60 Hz
Power consumption: 54 W
Dimensions (approx.): 430 × 89 × 346 mm ($17 \times 3\,^5/_8 \times 13\,^5/_8$ in.) (width/height/depth) incl. projecting parts
Hard disk drive capacity: 160 GB
Mass (approx.): 5.9 kg (13.01 lb)
Operating temperature: 5 ºC to 35 ºC (41 ºF to 95 ºF)
Operating humidity: 25 % to 80 %
Supplied accessories:
Audio/video cord (1)
Power cord (1)
Antenna cable (1)
Set top box controller (1)
Remote commander (remote) (1)
Size AA(R6) batteries (2)

Specifications and design are subject to change without notice.

DVD RECORDER

SONY

ACCESSORIES

Part No.	Description
1-478-987-11	REMOTE COMMANDER (RMT-D206A)
2-187-643-01	DOOR (RW2), SLID (FOR RMT-D206A)
3-071-119-91	LID, BATTERY CASE (FOR RMT-D206A)
1-751-271-71	CORD, CONNECTION (AV)
1-759-586-21	CONTROLER, VIDEO
1-765-635-71	CORD, CONNECTION (NTSC)
1-823-701-11	CORD, POWER
2-187-189-11	MANUAL, INSTRUCTION (ENGLISH)
2-187-189-21	MANUAL, INSTRUCTION (FRENCH)
2-187-190-11	GUIDE, QUICK START (ENGLISH)
2-187-190-21	GUIDE, QUICK START (FRENCH)

9-874-821-31

Sony Corporation
Home Electronics Network Company

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RDR-HX900

RMT-D206A

SERVICE MANUAL

CND Model

Self Diagnosis Supported model

SPECIFICATIONS

System

Laser: Semiconductor laser
Channel coverage:
NTSC
VHF: 2 to 13/UHF: 14 to 69/CATV: A-8 to A-1, A to W, W+1 to W+84
Video reception: Frequency synthesizer system
Audio reception: Split carrier system
Antenna: 75-ohm antenna terminal for VHF/UHF
Timer: Clock: Quartz locked/Timer indication: 12-hour cycle (digital)/Power back-up duration: 1 hour
Video recording format: MPEG Video
Audio recording format/applicable bit rate: Dolby Digital, 2 ch/256 kbps

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* "Y/Pb/Pr In Black Level" is "On"
** "Y/Pb/Pr In Black Level" is "Off"
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Outputs

(**Jack name:** Jack type/output level/output impedance)
LINE OUT 1/2
(AUDIO): Phono jack/2 Vrms/10 kilohms
(VIDEO): Phono jack/1.0 Vp-p
(S VIDEO): 4-pin mini DIN/Y:1.0 Vp-p, C: 0.286 Vp-p
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Mass (approx.): 5.9 kg (13.01 lb)
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Operating humidity: 25 % to 80 %
Supplied accessories:
Audio/video cord (1)
Power cord (1)
Antenna cable (1)
Set top box controller (1)
Remote commander (remote) (1)
Size AA(R6) batteries (2)

Specifications and design are subject to change without notice.

DVD RECORDER

SONY

WARNING!!

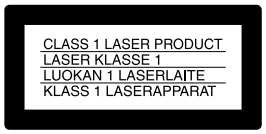
WHEN SERVICING, DO NOT APPROACH THE LASER EXIT WITH THE EYE TOO CLOSELY. IN CASE IT IS NECESSARY TO CONFIRM LASER BEAM EMISSION, BE SURE TO OBSERVE FROM A DISTANCE OF MORE THAN 25 cm FROM THE SURFACE OF THE OBJECTIVE LENS ON THE OPTICAL PICK-UP BLOCK.

CAUTION:

The use of optical instrument with this product will increase eye hazard.

CAUTION

Use of controls or adjustments or performance of procedures other than those specified herein may result in hazardous radiation exposure.



Unleaded solder

Boards requiring use of unleaded solder are printed with the lead-free mark (LF) indicating the solder contains no lead.
(Caution: Some printed circuit boards may not come printed with the lead free mark due to their particular size.)

: LEAD FREE MARK

Unleaded solder has the following characteristics.

- Unleaded solder melts at a temperature about 40°C higher than ordinary solder.
  Ordinary soldering irons can be used but the iron tip has to be applied to the solder joint for a slightly longer time.
  Soldering irons using a temperature regulator should be set to about 350°C.
  Caution: The printed pattern (copper foil) may peel away if the heated tip is applied for too long, so be careful!
- Strong viscosity
  Unleaded solder is more viscous (sticky, less prone to flow) than ordinary solder so use caution not to let solder bridges occur such as on IC pins, etc.
- Usable with ordinary solder
  It is best to use only unleaded solder but unleaded solder may also be added to ordinary solder.

SAFETY-RELATED COMPONENT WARNING!!

COMPONENTS IDENTIFIED BY MARK ⚠ OR DOTTED LINE WITH MARK ⚠ ON THE SCHEMATIC DIAGRAMS AND IN THE PARTS LIST ARE CRITICAL TO SAFE OPERATION. REPLACE THESE COMPONENTS WITH SONY PARTS WHOSE PART NUMBERS APPEAR AS SHOWN IN THIS MANUAL OR IN SUPPLEMENTS PUBLISHED BY SONY.

ATTENTION AU COMPOSANT AYANT RAPPORT À LA SÉCURITÉ!

LES COMPOSANTS IDENTIFÉS PAR UNE MARQUE ⚠ SUR LES DIAGRAMMES SCHÉMATIQUES ET LA LISTE DES PIÈCES SONT CRITIQUES POUR LA SÉCURITÉ DE FONCTIONNEMENT. NE REMPLACER CES COMPOSANTS QUE PAR DES PIÈSES SONY DONT LES NUMÉROS SONT DONNÉS DANS CE MANUEL OU DANS LES SUPPÉMENTS PUBLIÉS PAR SONY.

SAFETY CHECK-OUT

After correcting the original service problem, perform the following safety checks before releasing the set to the customer.

1. Check the area of your repair for unsoldered or poorly-soldered connections. Check the entire board surface for solder splashes and bridges.
2. Check the interboard wiring to ensure that no wires are "pinched" or contact high-wattage resistors.
3. Look for unauthorized replacement parts, particularly transistors, that were installed during a previous repair. Point them out to the customer and recommend their replacement.
4. Look for parts which, through functioning, show obvious signs of deterioration. Point them out to the customer and recommend their replacement.
5. Check the B+ voltage to see it is at the values specified.
6. Flexible Circuit Board Repairing
   - Keep the temperature of the soldering iron around 270˚C during repairing.
   - Do not touch the soldering iron on the same conductor of the circuit board (within 3 times).
   - Be careful not to apply force on the conductor when soldering or unsoldering.

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SERVICE NOTE

1. DISK REMOVAL PROCEDURE IF THE TRAY CANNOT BE EJECTED (FORCED EJECTION)

1. Remove the upper case.
2. Remove the RD-55 board, RD bracket.
3. IInsert the stiff wire in the hole and eject the tray.

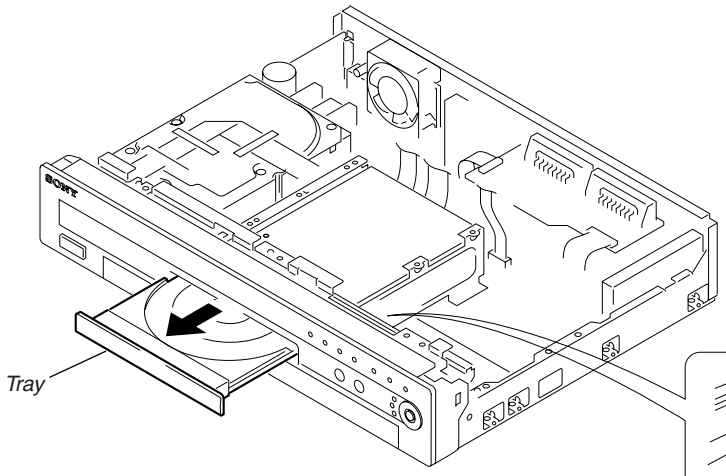

Fig. 1

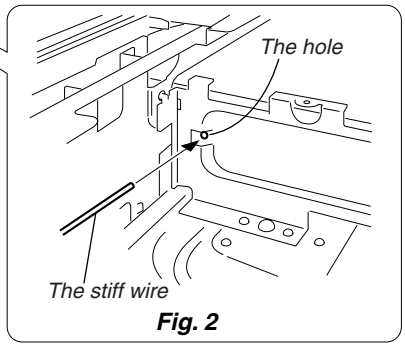

Fig. 2

NOTES DURING THE FORCED EJECTION

1. If the forced ejection is executed while a blank disc media (DVD±RW, ±R) exists on the tray

• Insert a DVD-ROM (DVD test disc, DVD software available on the market, or the like) in the tray and then close the tray.

Note1: If you close the tray while it is empty, ejection of the tray becomes impossible.

Note2: If you close the tray with a CD disc inserted in it, the CD can be ejected. However, if you close the tray while it is empty, there can be a case that ejection of the tray becomes impossible.

Note3: Even if you replace the DVD drive unit while the tray remains under the state as described above, the situation cannot be improved.

2. If the tray cannot be ejected while the disc is not inserted

• Execute the forced ejection.

• Insert a DVD-ROM (DVD test disc, DVD software available on the market, or the like) on the tray and try to close the tray.
(There are cases that it recovers the trouble.)

3. Contents of forcedly ejected blank disc media (DVD±RW, ±R) can be damaged. (There can be a case that initialization is also impossible.)

MEMO

SECTION 1
GENERAL

This section is extracted from instruction manual.
(RDR-HX900 : 2-187-189-11 (1))

WARNING

To prevent fire or shock hazard, do not expose the unit to rain or moisture.
To avoid electrical shock, do not open the cabinet. Refer servicing to qualified personnel only.
The AC power cord must be changed only at a qualified service shop only.

CAUTION

The use of optical instruments with this product will increase eye hazard. As the laser beam used in this DVD recorder is harmful to eyes, do not attempt to disassemble the cabinet. Refer servicing to qualified personnel only.

CAUTION
RISK OF ELECTRIC SHOCK DO NOT OPEN
CAUTION: TO REDUCE THE RISK OF ELECTRIC SHOCK, DO NOT REMOVE COVER (OR BACK). NO USER-SERVICEABLE PARTS INSIDE. REFER SERVICING TO QUALIFIED SERVICE PERSONNEL.

This symbol is intended to alert the user to the presence of uninsulated "dangerous voltage" within the product's enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons.

This symbol is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the appliance.

For customers in the U.S.A
Owner's Record
The model and serial numbers are located at the rear of the unit.
Record the serial number in the space provided below. Refer to them whenever you call upon your Sony dealer regarding this product.
Model No. RDR-HX900
Serial No._____

CAUTION

You are cautioned that any change or modifications not expressly approved in this manual could void your authority to operate this equipment.

Note

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:
– Reorient or relocate the receiving antenna.
– Increase the separation between the equipment and receiver.
– Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
– Consult the dealer or an experienced radio/TV technician for help.

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The TV Guide On Screen system is protected by one or more of the following issued United States patents 6,498,895, 6,418,556, 6,331,877; 6,239,794; 6,154,203; 5,940,073; 4,908,713; 4,751,578; 4,706,121.

Precautions

This equipment has been tested and found to comply with the limits set out in the EMC Directive using a connection cable shorter than 3 meters.

On safety

Should any solid object or liquid fall into the cabinet, unplug the recorder and have it checked by qualified personnel before operating it any further.

About the hard disk drive

The hard disk has a high storage density, which enables long recording durations and quick access to the written data. However, it can easily be damaged by shock, vibration or dust, and should be kept away from magnets. To avoid losing important data, observe the following precautions.
- Do not use the recorder in a place subject to extreme changes in temperature (temperature gradient less than 10 °C/hour).
- Do not apply a strong shock to the recorder.
- Do not place the recorder in a location subject to mechanical vibrations or in an unstable location.
- Do not place the recorder on top of a heat source, such as a VCR or AV amplifier (receiver).
- Do not move the recorder with its AC power cord connected.
- Do not move the recorder for one minute after you have unplugged the AC power cord. After one minute, move the recorder without shock or vibration.
- Do not disconnect the AC power cord while the power is on.
- Do not attempt to change the hard disk. This may result in a malfunction.
  Should the hard disk be damaged, you cannot recover lost data. The hard disk is only a temporary storage space.

On placement

- Place the recorder in a location with adequate ventilation to prevent heat build-up in the recorder.
- Do not place the recorder on a soft surface such as a rug that might block the ventilation holes.
- Do not place the recorder in a confined space such as a bookshelf or similar unit.
- Do not place the recorder in a location near heat sources, or in a place subject to direct sunlight, excessive dust, or mechanical shock.
- Do not place the recorder in an inclined position. It is designed to be operated in a horizontal position only.
- Keep the recorder and discs away from equipment with strong magnets, such as microwave ovens, or large loudspeakers.
- Do not place heavy objects on the recorder.
- To prevent fire or shock hazard, do not place objects filled with liquids, such as vases, on the apparatus.

On power sources

- The recorder is not disconnected from the AC power source as long as it is connected to the wall outlet, even if the recorder itself has been turned off.
- If you are not going to use the recorder for a long time, be sure to disconnect the recorder from the wall outlet. To disconnect the AC power cord, grasp the plug itself; never pull the cord.
- Before disconnecting the AC power cord, check that the recorder's hard disk is not operating (recording or dubbing) on the front panel display.

On recording

Make trial recordings before making the actual recording.

On compensation for lost recordings

Sony is not liable and will not compensate for any lost recordings or relevant losses, including when recordings are not made due to reasons including recorder failure, or when the contents of a recording are lost or damaged as a result of recorder failure or repair undertaken to the recorder. Sony will not restore, recover, or replicate the recorded contents under any circumstances.

Copyrights

- Television programs, films, video tapes, discs, and other materials may be copyrighted. Unauthorized recording of such material may be contrary to the provisions of the copyright laws. Also, use of this recorder with cable television transmission may require authorization from the cable television transmitter and/or program owner.
- This product incorporates copyright protection technology that is protected by U.S. patents and other intellectual property rights. Use of this copyright protection technology must be authorized by Macrovision, and is intended for home and other limited viewing uses only unless otherwise authorized by Macrovision. Reverse engineering or disassembly is prohibited.

Copy guard function

Since the recorder has a copy guard function, programs received through an external tuner (not supplied) may contain copy protection signals (copy guard function) and as such may not be recordable, depending on the type of signal.

IMPORTANT NOTICE

Caution: This recorder is capable of holding a still video image or on-screen display image on your television screen indefinitely. If you leave the still video image or on-screen display image displayed on your TV for an extended period of time you risk permanent damage to your television screen. Plasma display panels and projection televisions are especially susceptible to this.

If you have any questions or problems concerning your recorder, please consult your nearest Sony dealer.

IMPORTANT SAFETY INSTRUCTIONS

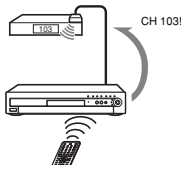
1 Read these instructions.
2 Keep these instructions.
3 Heed all warnings.
4 Follow all instructions.
5 Do not use this apparatus near water.
6 Clean only with dry cloth.
7 Do not block any ventilation openings. Install in accordance with the manufacturer's instructions.
8 Do not install near any heat sources such as radiators, heat registers, stoves, or other apparatus (including amplifiers) that produce heat.
9 Do not defeat the safety purpose of the polarized or grounding-type plug. A polarized plug has two blades with one wider than the other. A grounding type plug has two blades and a third grounding prong. The wide blade or the third prong are provided for your safety. If the provided plug does not fit into your outlet, consult an electrician for replacement of the obsolete outlet.
10 Protect the power cord from being walked on or pinched particularly at plugs, convenience receptacles, and the point where they exit from the apparatus.
11 Only use attachments/ accessories specified by the manufacturer.
12 Use only with the cart, stand, tripod, bracket, or table specified by the manufacturer, or sold with the apparatus. When a cart is used, use caution when moving the cart/apparatus combination to avoid injury from tip-over.

13 Unplug this apparatus during lightning storms or when unused for long periods of time.
14 Refer all servicing to qualified service personnel. Servicing is required when the apparatus has been damaged in any way, such as power-supply cord or plug is damaged, liquid has been spilled or objects have fallen into the apparatus, the apparatus has been exposed to rain or moisture, does not operate normally, or has been dropped.

Ways to Use Your DVD Recorder

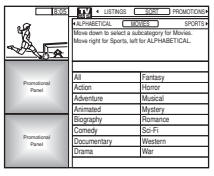
Control your cable box or satellite receiver – Set top box control

➡ Connect the supplied set top box controller to have the recorder change the channel of your cable box or satellite receiver during a timer recording (page 14).



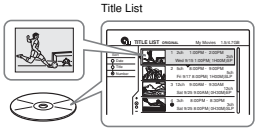
Easily search for programs with the TV Guide On Screen system – TV Guide

➡ The TV Guide On Screen system displays a free television program listing. Search for your favorite program alphabetically or by category, such as movies or sports, and then set the timer to record that program with just the push of a button (page 46).



Quickly access recorded titles – Title List

➡ Display the Title List to see all of the titles on the disc, including recording date, channel, recording mode and thumbnail image (page 37). The recorder will automatically take program label information from the TV Guide On Screen data* and display it as the title name (page 37).
* not available in some areas.

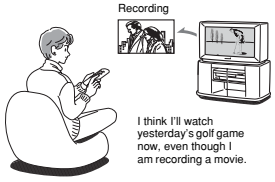


Play the beginning of a title while it is being recorded – Chasing Playback

➡ If you are using a DVD-RW (VR mode) or the HDD, you can watch a program from the beginning while it is being recorded (page 60).

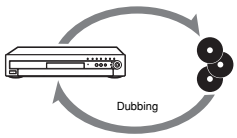
Watch one title while recording another – Simultaneous Rec and Play

➡ If you are using a DVD-RW (VR mode) or the HDD, you can watch a previously recorded program while recording another program on the same disc (page 60).



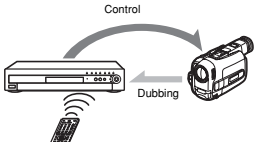
Copy a recorded title to and from the HDD – Dubbing (HDD ⟷ DVD)

➡ Create copies of your favorite titles for safekeeping by dubbing them to a DVD, or make a copy of your friend's recordings by dubbing them to the HDD (page 72).



Automatically dub DV/Digital8 tapes – DV/Digital8 Dubbing (DV ⟶ HDD/DVD)

➡ Connect your digital video camera to the DV IN jack and automatically dub the entire contents or just selected scenes to a DVD disc (page 77).



A list of recordable and playable discs is on page 8.

Quick Guide to Disc Types

Recordable and playable discs

Type		Disc Logo	Icon used in this manual	Formatting (new discs)	Compatibility with other DVD players (finalizing)		Recording Features				Editing Features			
							Rewrite (page 45)	Auto Chapter (page 91)	Manual Chapter (page 68)	Record 16:9 sizes (page 51)	Change title name (page 65)	Delete title (page 66)	A-B Erase (page 66)	Playlist (page 68)
Hard disk drive (internal)		HDD	HDD	(Formatting unnecessary)	–		Yes	Yes	Yes	Yes	Yes	Yes	Yes	No
DVD+RW		DVD+ReWritable	+RW	Automatically formatted	Playable on DVD+RW compatible players (automatically finalized)		Yes	Yes	No	No	Yes	Yes	Yes	No
DVD-RW	VR mode	DVD RW	-RWVR	Format in VR mode (page 40)	Playable only on VR mode compatible players (finalization unnecessary)		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
	Video mode		-RWVideo	Format in Video mode (page 40)	Playable on most DVD players (finalization necessary) (page 40)		Yes	Yes	No	Yes *2	Yes	Yes	No	No
DVD+R		DVD+R	+R	Automatically formatted	Playable on most DVD+R compatible players (finalization necessary) (page 40)		No	Yes	No	No	Yes	Yes *3	No	No
DVD-R		R R4.7	-R	Automatically formatted	Playable on most DVD players (finalization necessary) (page 40)		No	Yes	No	Yes *2	Yes	Yes *3	No	No

Usable disc versions (as of May 2004)

- 4x-speed or slower DVD+RWs
- 2x-speed or slower DVD-RWs (Ver.1.1, Ver.1.1 with CPRM*1)
- 8x-speed or slower DVD+Rs
- 8x-speed or slower DVD-Rs (Ver.2.0)

"DVD+RW," "DVD-RW," "DVD+R," and "DVD-R," are trademarks.

*1 CPRM (Content Protection for Recordable Media) is a coding technology that protects copyrights for images.

*2 Only if the recording mode is SP, HSP, or HQ, and "DVD Rec. Picture Size" is set to "16:9."

*3 Erasing titles does not free up disc space.

Discs that cannot be recorded on

- 4x-speed compatible DVD-RWs (Ver. 1.2/4x)
- DVD-RWs (Ver. 1.0)
- DVD+RWs that are not 2.4x-speed compatible
- Dual layer discs
- 8 cm discs

→continued

Playable discs

Type	Disc Logo	Icon used in this manual	Characteristics
DVD VIDEO	DVD VIDEO	DVD	Discs such as movies that can be purchased or rented
VIDEO CD	COMPACT disc DIGITAL VIDEO	VCD	VIDEO CDs or CD-Rs/CD-RWs in VIDEO CD/Super VIDEO CD format
CD	COMPACT disc DIGITAL AUDIO	CD	Music CDs or CD-Rs/CD-RWs in music CD format that can be purchased
DATA CD	COMPACT disc Recordable ReWritable	DATA CD	CD-ROMs/CD-Rs/CD-RWs created on a PC or similar device in music format containing MP3 audio tracks

Discs that cannot be played

- All CD-ROMs (including PHOTO CDs)
- CD-Rs/CD-RWs, other than those recorded in music CD format, MP3 format, or Video CD format
- Data part of CD-Extras
- DVD-ROMs
- DVD Audio discs
- DVD-RAMs
- HD layer on Super Audio CDs
- DVD VIDEOs with a different region code (page 11)
- A disc recorded in a color system other than NTSC, such as PAL or SECAM

Hint

This DVD recorder can play 8 cm CDs and 8 cm DVDs as well.

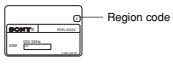
Note on playback operations of DVD VIDEOs/ VIDEO CDs

Some playback operations of DVD VIDEOs/ VIDEO CDs may be intentionally set by software producers. Since this recorder plays DVD VIDEOs/VIDEO CDs according to the disc contents the software producers designed, some playback features may not be available. Also, see the instructions supplied with the DVD VIDEOs/ VIDEO CDs.

Region code (DVD VIDEO only)

Your recorder has a region code printed on the rear of the unit and will only play DVD VIDEOs (playback only) labeled with identical region codes. This system is used to protect copyrights. DVD VIDEOs labeled (ALL) will also play on this recorder.

If you try to play any other DVD VIDEO, the message "Playback prohibited by region code." will appear on the TV screen. Depending on the DVD VIDEO, no region code indication may be labeled even though playing the DVD VIDEO is prohibited by area restrictions.



Music discs encoded with copyright protection technologies

This product is designed to playback discs that conform to the Compact Disc (CD) standard. Recently, various music discs encoded with copyright protection technologies are being marketed by some record companies. Please be aware that among those discs, there are some that do not conform to the CD standard and may not be playable by this product.

Notes

- You cannot mix VR mode and Video mode on the same DVD-RW. To change the disc's format, reformat the disc (page 40). Note that the disc's contents will be erased after reformatting.
- You cannot shorten the time required for recording even with high-speed discs. Also, you cannot record on the disc if the disc is not 1x speed compatible.
- It is recommended that you use discs with "For Video" printed on their packaging.
- You cannot add new recordings to DVD-Rs or DVD-RWs (Video mode) that contain recordings made on other DVD equipment.
- In some cases, you may not be able to add new recordings to DVD+RWs that contain recordings made on other DVD equipment. If you do add a new recording, note that this recorder will rewrite the DVD menu.
- If the disc contains PC data unrecognizable by this recorder, the data may be erased.
- Some DVD+RWs/DVD+Rs, DVD-RWs/DVD-Rs, or CD-RWs/CD-Rs cannot be played on this recorder due to the recording quality or physical condition of the disc, or the characteristics of the recording device and authoring software. The disc will not play if it has not been correctly finalized. For more information, see the operating instructions for the recording device.

Hooking Up the Recorder

Follow steps 1 to 7 to hook up and adjust the settings of the recorder.

Notes

- Plug cords securely to prevent unwanted noise.
- Refer to the instructions supplied with the components to be connected.
- You cannot connect this recorder to a TV that does not have a video input jack.
- Be sure to disconnect the power cord of each component before connecting.

Step 1: Unpacking

Check that you have the following items:

- Audio/video cord (pinplug × 3 ⟷ pinplug × 3) (1)
- Power cord (1)
- Antenna cable (1)
- Remote commander (remote) (1)
- Set top box controller (1)
- Size AA (R6) batteries (2)

Step 2: Connecting the Antenna Cable and Set Top Box Controller

Select one of the following antenna hookups. Do not connect the power cord until you reach "Step 5: Connecting the Power Cord" (page 21).

If you have	Hookup
Cable box or satellite receiver with a video/audio output	A (page 13)
Cable box with an antenna output only	B (page 14)
Cable without cable box, or antenna only (no cable TV)	C (page 15)

Using the cable box/satellite receiver control function

The cable box/satellite receiver control function can be used with hookup A or B. It allows the recorder to control a cable box or satellite receiver via the supplied set top box controller. The recorder controls channels on the cable box or satellite receiver for timer recording. You can also use the recorder's remote control to change channels on the cable box/satellite receiver whenever the cable box/satellite receiver is turned on, even if the recorder is turned off.

To use the cable box/satellite receiver control function, you need to connect the set top box controller and set the code number and output channel (page 24). After setting up the cable box/satellite receiver control, check that the recorder can correctly control the cable box or satellite receiver (page 28).

Note to CATV system installer (in USA)

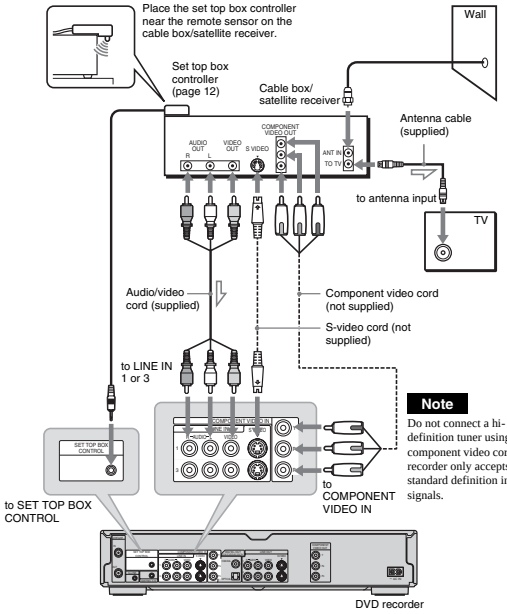
This reminder is provided to call the CATV system installer's attention to Article 820- 40 of the NEC that provides guidelines for proper grounding and, in particular, specifies that the cable ground shall be connected to the grounding system of the building, as close to the point of cable entry as practical.

Notes

- If your antenna is a flat cable (300-ohm twin lead cable), use an external antenna connector (not supplied) to connect the antenna to the recorder.
- If you have separate cables for VHF and UHF antennas, use a UHF/VHF band mixer (not supplied) to connect the antenna to the recorder.
- If you have made hookup A or B and want to use the TV Guide On Screen system, the cable box must be turned on, the set top box controller must be connected, and "Set Top Box Control" in Settings Setup must be set to "On" (page 86) to download the TV Guide On Screen data.
- If you are using the TV Guide On Screen system and the recorder is receiving TV Guide On Screen data, you may not be able to use the remote control to change channels on the cable box when the recorder is off. Wait until the recorder has finished receiving TV Guide On Screen data.

A: Cable box or satellite receiver with a video/audio output

With this hookup, you can record any channel on the cable box or satellite receiver. Be sure that the satellite receiver or cable box is turned on.
To watch cable or satellite programs, you need to match the channel on the recorder (L1 or L3) to the input jack connected to the cable box or satellite receiver (LINE IN 1 or 3). Note that satellite receiver programs do not appear in the TV Guide On Screen system.


Place the set top box controller near the remote sensor on the cable box/satellite receiver.
Wall
Set top box controller (page 12)
Cable box/ satellite receiver
Antenna cable (supplied)
to antenna input
TV
Audio/video cord (supplied)
Component video cord (not supplied)
S-video cord (not supplied)
to LINE IN 1 or 3
to SET TOP BOX CONTROL
to COMPONENT VIDEO IN
DVD recorder

: Signal flow

Note

Do not connect a hi-definition tuner using the component video cords. This recorder only accepts standard definition interlace signals.

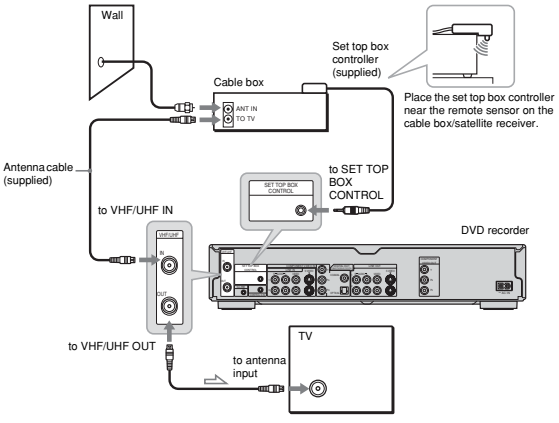
Hints

- If your cable box or satellite receiver has an S-video jack or component output jacks, you can use an S-video cord (not supplied) or component video cord (not supplied) instead of the audio/video cord. When you connect using a component video cord, connect the audio cords to the LINE IN jacks.
- If you connect an S-video cord to the LINE IN 1 jack or a component video cord, set "Line1 Input" in Video Setup to "S Video" or "Component" (page 89). If you connect an S-video cord to the LINE IN 3 jack, set "Line3 Input" in Video Setup to "S Video" (page 89).

→continued

B: Cable box with an antenna output only

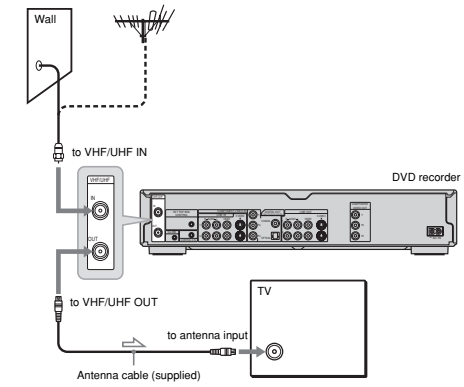
With this hookup, you can record any channel on the satellite receiver or cable box. Be sure that the satellite receiver or cable box is turned on.
To watch cable programs, you need to match the channel on the recorder (2ch, 3ch, or 4ch) to the antenna output channel on the cable box (2ch, 3ch, or 4ch).



: Signal flow

C: Cable without cable box, or antenna only (no cable TV)

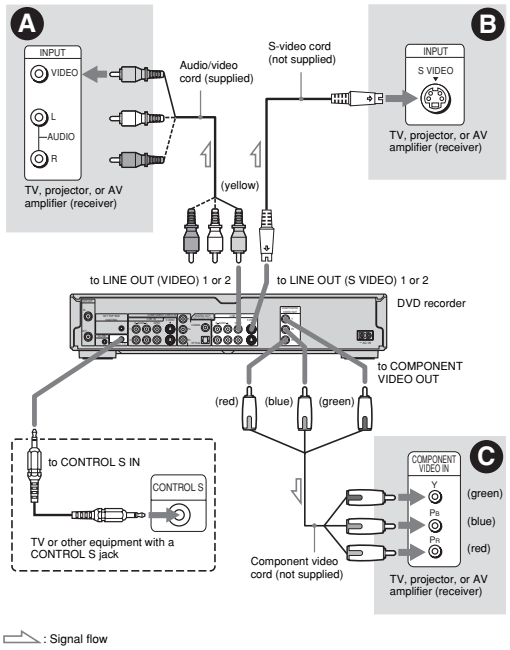
Use this hookup if you watch cable channels without a cable box. Also use this hookup if you are using a VHF/UHF antenna or separate VHF and UHF antennas.
With this hookup, you can record any channel by selecting the channel on the recorder.



: Signal flow

Step 3: Connecting the Video Cords

Select one of the following patterns Ⓐ through Ⓒ, according to the input jack on your TV monitor, projector, or AV amplifier (receiver). This will enable you to view pictures. Audio connections are explained in “Step 4: Connecting the Audio Cords” (page 19).



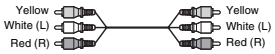
: Signal flow

Note

Do not connect more than one type of video cord between the recorder and your TV at the same time.

Ⓐ Connecting to a video input jack

Connect the yellow plug of the audio/video cord (supplied) to the yellow (video) jack. You will enjoy standard quality images.
Note that you cannot use the PROGRESSIVE button with this connection.

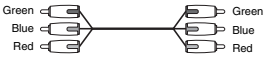


Ⓑ Connecting to an S VIDEO input jack

Connect an S-video cord (not supplied). You will enjoy high quality images.
Note that you cannot use the PROGRESSIVE button with this connection.

Ⓒ Connecting to component video input jacks (Y, P_B, P_R)

Connect the COMPONENT VIDEO OUT jacks using a component video cord (not supplied) or three video cords (not supplied) of the same kind and length. You will enjoy accurate color reproduction and high quality images.
If your TV accepts progressive 480p format signals, you must use this connection and then press PROGRESSIVE on the remote to send progressive video signals. For details, see “Using the PROGRESSIVE button” (page 18).



When playing “wide screen” images

Some recorded images may not fit your TV screen. To change the aspect ratio, see page 87.

If you are connecting to a VCR

Connect your VCR to the LINE IN (VIDEO) jack on the recorder (page 29).

If your TV has a CONTROL S jack

You can control the recorder by pointing the remote at your TV. This feature is convenient when you place the recorder and the TV away from each other.
After connecting the recorder to other equipment in pattern Ⓐ, Ⓑ, or Ⓒ above, connect the CONTROL S IN jack to your TV’s CONTROL S (OUT) jack using a control S cord (not supplied). See the instructions supplied with the TV to be connected. Note that your TV’s input will not automatically switch to this recorder when you play a disc.

➞continued 17

Using the PROGRESSIVE button

By using the PROGRESSIVE button on the remote, you can select the signal format in which the recorder outputs video signals: Interlace or Progressive.
Connect the recorder using the COMPONENT VIDEO OUT jacks (pattern Ⓒ above), and press PROGRESSIVE repeatedly. “PROGRESSIVE” appears in the front panel display when the recorder outputs progressive signals.

◆Progressive

Select this when:
– your TV accepts progressive signals, and,
– the TV is connected to the COMPONENT VIDEO OUT jacks.

Note that the pictures will not be clear or no picture will appear if you select progressive signal output when either of the above conditions is not met.

◆Interlace

Set to this position when:
– your TV does not accept progressive signals, or,
– your TV is connected to jacks other than the COMPONENT VIDEO OUT jacks (LINE OUT (VIDEO) or S VIDEO).

Hint

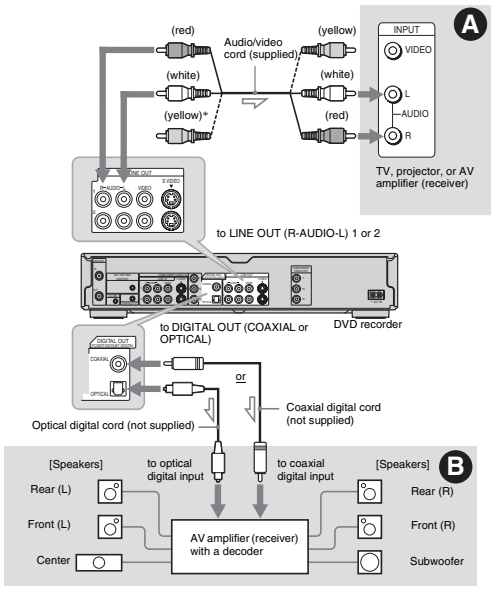
When you select progressive signal output, you can fine-tune the signal according to the type of software you are watching (page 88).

Notes

- Consumers should note that not all high definition television sets are fully compatible with this product and may cause artifacts to be displayed in the picture. In the case of 480 progressive scan picture problems, it is recommended that the user switch the connection to the ‘standard definition’ output. If there are questions regarding our TV set compatibility with this model 480p DVD recorder, please contact our customer service center.
- TV Guide On Screen does not appear if you connect your TV using the video or S-video jacks and press the PROGRESSIVE button on the remote, even if your TV accepts progressive signals.

Step 4: Connecting the Audio Cords

Select one of the following patterns Ⓐ or Ⓑ, according to the input jack on your TV monitor, projector, or AV amplifier (receiver).
This will enable you to listen to sound.



: Signal flow

* The yellow plug is used for video signals (page 17).

Hint

For correct speaker location, see the operating instructions supplied with the connected components.

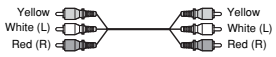
Note

Do not connect your TV’s audio output jacks to the LINE IN (AUDIO L/R) jacks at the same time. This will cause unwanted noise to come from your TV’s speakers.

➞continued 19

Ⓐ Connecting to audio L/R input jacks

This connection will use your TV's or stereo amplifier's (receiver's) two speakers for sound. Connect using the audio/video cord (supplied).



• Surround effect (page 56)
TV: Dynamic, Wide, Night

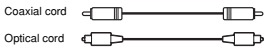
Stereo amplifier (receiver): Standard, Night

Note

Do not connect your TV's audio output jacks to the LINE IN (AUDIO L/R) jacks at the same time. This will cause unwanted noise to come from your TV's speakers.

Ⓑ Connecting to a digital audio input jack

If your AV amplifier (receiver) has a Dolby*1 Digital or DTS*2 decoder and a digital input jack, use this connection.
Connect using a coaxial or optical digital cord (not supplied).



• Surround effect
Dolby Digital (5.1ch), DTS (5.1ch)

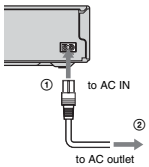
*1 Manufactured under license from Dolby Laboratories. "Dolby," "Pro Logic," and the double-D symbol are trademarks of Dolby Laboratories.
*2 "DTS" and "DTS Digital Out" are trademarks of Digital Theater Systems, Inc.

Notes

- After you have completed the connection, make the appropriate settings under "Audio Connection" in Easy Setup (page 24). Otherwise, no sound or a loud noise will come from your speakers.
- The surround sound effects of this recorder cannot be used with this connection.

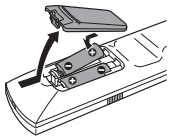
Step 5: Connecting the Power Cord

Connect the supplied power cord to the AC IN terminal of the recorder. Then plug the recorder and TV power cords into an AC outlet. After you connect the power cord, **you must wait for a short while before operating the recorder.** You can operate the recorder only after the front panel display lights up and the recorder enters standby mode.
If you connect additional equipment to this recorder (page 29), be sure to connect the power cord only after all connections are complete.



Step 6: Preparing the Remote

You can control the recorder using the supplied remote. Insert two size AA (R6) batteries by matching the ⊕ and ⊖ ends on the batteries to the markings inside the battery compartment. When using the remote, point it at the remote sensor R on the recorder.



Notes

- If the supplied remote interferes your other Sony DVD recorder or player, change the command mode number for this recorder (page 23).
- Use the batteries correctly to avoid possible leakage and corrosion. Do not touch the liquid with bare hands should leakage occur. Observe the following:
  – Do not use a new battery with an old battery, or batteries of different manufacturers.
  – Do not attempt to recharge the batteries.
  – If you do not intend to use the remote for an extended period of time, remove the batteries.
  – If battery leakage occurs, wipe out any liquid inside the battery compartment, and insert new batteries.
- Do not expose the remote sensor (marked R on the front panel) to strong light, such as direct sunlight or lighting apparatus. The recorder may not respond to the remote.

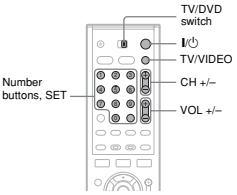
➡continued

Controlling TVs with the remote

You can adjust the remote control's signal to control your TV.
If you connected the recorder to an AV amplifier (receiver), you can also use the supplied remote to control the AV amplifier's (receiver's) volume (page 23).

Notes

- Depending on the connected unit, you may not be able to control your TV or AV amplifier (receiver) with some or all of the buttons below.
- If you enter a new code number, the code number previously entered will be erased.
- When you replace the batteries of the remote, the code number may be reset to the default setting. Set the appropriate code number again.



1 Slide the TV/DVD switch to TV.

2 Hold down I/⏻.

3 Enter your TV's manufacturer code (see "Code numbers of controllable TVs" below) using the number buttons.

4 Release I/⏻.
When the TV/DVD switch is set to TV, the remote performs the following:

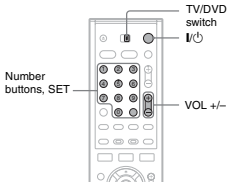
I/⏻	Turns your TV on or off
VOL +/–	Adjusts the volume of your TV
CH +/–	Selects the channel on your TV
TV/VIDEO	Switches your TV's input source
Number buttons and SET	Selects the channel on your TV

Code numbers of controllable TVs
If more than one code number is listed, try entering them one at a time until you find the one that works with your TV.

Manufacturer	Code number
Sony	01 (default)
Akai	04
AOC	04
Centurion	12
Coronado	03
Curtis-Mathes	12, 14
Daewoo	04, 22
Daytron	03, 12
Fisher	11
General Electric	04, 06, 10
Gold Star/LG	03, 04, 17
Hitachi	02, 03, 04
J.C.Penney	04, 10, 12
JVC	09
KMC	03
Magnavox	03, 04, 08, 12, 21
Marantz	04, 13
MGA/Mitsubishi	04, 12, 13, 17
NEC	04, 12
Panasonic	06, 19
Philco	02, 03, 04, 08
Philips	08, 21
Pioneer	06, 16
Portland	03
Proscan	10
Quasar	06, 18
Radio Shack	05, 10, 14
RCA	04, 10
Sampo	12
Samsung	03, 04, 12, 20
Sanyo	11, 14
Scott	12
Sears	07, 10, 11
Sharp	03, 05, 18

Manufacturer	Code number
Sylvania	08, 12
Teknika	03, 08, 14
Toshiba	07, 18
Wards	03, 04, 12
Yorx	12
Zenith	14, 15

Controlling the volume of your AV amplifier (receiver) with the remote



1 Slide the TV/DVD switch to DVD.

2 Hold down I/⏻, and enter the manufacturer code (see the table below) for your AV amplifier (receiver) using the number buttons.

3 Release I/⏻.
The VOL +/– buttons control the AV amplifier's volume.
If you want to control the TV's volume, slide the TV/DVD switch to TV.

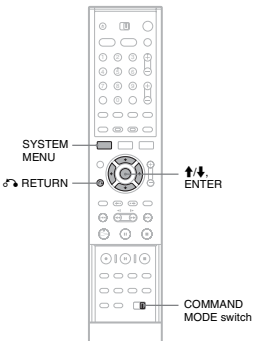
Hint
If you want to control the TV's volume even when the TV/DVD switch is set to DVD, repeat the steps above and enter the code number 90 (default).

Code numbers of controllable AV amplifiers (receivers)
If more than one code number is listed, try entering them one at a time until you find the one that works with your AV amplifier (receiver).

Manufacturer	Code number
Sony	78, 79, 80, 91
Denon	84, 85, 86
Kenwood	92, 93
Onkyo	81, 82, 83
Pioneer	99
Sansui	87
Technics	97, 98
Yamaha	94, 95, 96

If you have a Sony DVD player or more than one Sony DVD recorder

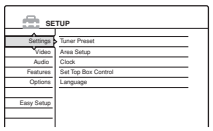
If the supplied remote interferes with your other Sony DVD recorder or player, set the command mode number for this recorder and the supplied remote to one that differs from the other Sony DVD recorder or player.
The default command mode setting for this recorder and the supplied remote is DVD3.



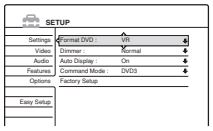
➡continued

1 Press SYSTEM MENU.
The System Menu appears.

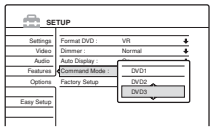
2 Select “SETUP,” and press ENTER.



3 Select “Options,” and press ENTER.



4 Select “Command Mode,” and press ENTER.



5 Select the Command mode (DVD1, DVD2, or DVD3), and press ENTER.

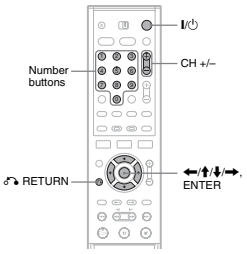
6 Slide the COMMAND MODE switch on the remote so it matches the mode you selected above.

To return to the previous step
Press ↶ RETURN.

Step 7: Easy Setup

Follow the steps below to make the minimum number of basic adjustments for using the recorder. If you do not complete Easy Setup, it will appear each time you turn on your recorder. Settings are made in the following order.
Note that television program listings do not appear in the TV Guide On Screen system as soon as you complete Easy Setup. You must leave the recorder turned off for at least 24 hours to receive the TV Guide On Screen data. If your recorder is connected to a cable box, be sure to leave the cable box turned on.

Area Setup
↓
OSD Language Setup
↓
Clock Setup
↓
Cable Box/Sat. Control Setup
↓
Tuner and Channel Setup
↓
TV Type Setup
↓
Audio Connection Setup
↓
Finished!

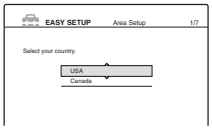


1 Turn on the TV.

2 Press I/⏻.
The recorder turns on.

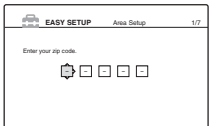
3 Switch the input selector on your TV so that the signal from the recorder appears on your TV screen.
“Initial settings necessary to operate the DVD recorder will be made. You can change them later using Setup. Before you start, check that you have made all necessary connections.” appears.
• If this message does not appear, select “Easy Setup” from “SETUP” in the System Menu to run Easy Setup. For details, see “Settings and Adjustments” on page 83.

4 Press ENTER.
The Setup Display for entering your area of residence appears. This will enable you to use the TV Guide On Screen system (page 33). Enter your area of residence even if you do not want to use the TV Guide On Screen system.

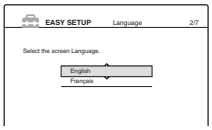


5 Select a country, and press ENTER.
The display for entering your zip code appears.

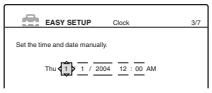
6 Enter your zip code number.
Use ↑/↓ to select the number or letter (for Canada) and ←/→ to move the cursor.



7 Press ENTER.
The Setup Display for selecting the language used in the on-screen display appears.

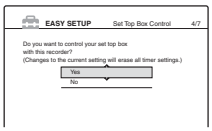


8 Select a language, and press ENTER.
The display for setting the clock appears.
If the clock data has already been received, go to step 10.



9 Enter the current date and time.
Press ↑/↓ to set the month and press →. Set the day, year, hour, and minutes in the same way. The day of the clock is set automatically.

10 Press ENTER.
The Setup Display for cable box/satellite receiver control appears.

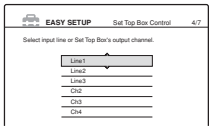

EASY SETUP
Set Top Box Control
4/7
Do you want to control your set top box with this recorder?
(Changes to the current setting will erase all timer settings.)
Yes
No

→continued

11 Set the cable box/satellite receiver control, and press ENTER.
If you want to use the cable box/satellite receiver control (page 14), select “Yes.”
If you do not have a cable box, select “No,” then go to step 15.

12 Enter the brand code of your cable box/satellite receiver.
See “Cable Box/Satellite Receiver Brand Code” (page 112).
Use ↑/↓ to select the number and ←/→ to move the cursor.

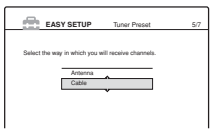
13 Press ENTER.



14 Select the cable box output channel.
If you connect your cable box or satellite receiver to the recorder’s audio/video input (page 13), select “Line1,” “Line2,” or “Line3,” then go to step 17.

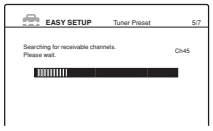
If you connect the satellite receiver or cable box to the recorder’s antenna input (page 14), select “Ch2,” ‘Ch3,” or “Ch4” and press ENTER, then go to step 17. See the instructions supplied with your cable box to confirm the cable box’s antenna output channel.

15 Select whether or not you have a cable connection.



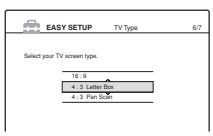
If you use an antenna only (no cable TV), select “Antenna.”
If you use a cable connection without a cable box, select “Cable.”

16 Press ENTER.
The Tuner Preset function automatically starts searching for all of the receivable channels and presets them.



To set the channels manually, see page 85.
After the Tuner Preset is finished, the Setup Display for selecting the aspect ratio of the connected TV appears.

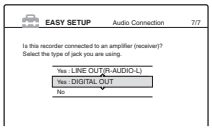
17 Select the setting that matches your TV type.



“4:3 Letter Box”: For standard TVs. Displays “wide screen” pictures with bands on the upper and lower sections of the screen.
“4:3 Pan Scan”: For standard TVs. Automatically displays “wide screen” pictures on the entire screen and cuts off the sections that do not fit.

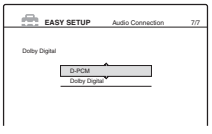
“16:9”: For wide-screen TVs or standard TVs with a wide screen mode.
For details, see “TV Type” on page 87.

18 Press ENTER.
The Setup Display for selecting the type of jack used to connect to your amplifier (receiver) appears.



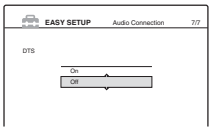
19 Select the type of jack (if any) you are using to connect to an amplifier (receiver), and press ENTER.
If you did not connect an AV amplifier (receiver), select “No,” then go to step 23.
If you connected an AV amplifier (receiver) using just an audio cord, select “Yes: LINE OUT (R-AUDIO-L),” then go to step 23.
If you connected an AV amplifier (receiver) using either a digital optical or coaxial cord, select “Yes: DIGITAL OUT.”

20 Select the type of Dolby Digital signal you wish to send to your amplifier (receiver).



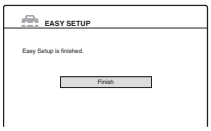
If your AV amplifier (receiver) has a Dolby Digital decoder, select “Dolby Digital.” Otherwise, select “D-PCM.”

21 Press ENTER.
The Setup Display for the DTS signal appears.



22 Select whether or not you wish to send a DTS signal to your amplifier (receiver), and press ENTER.
If your AV amplifier (receiver) has a DTS decoder, select “On.” Otherwise, select “Off.”

23 Press ENTER when “Finish” appears.
Easy Setup is finished. All connections and setup operations are complete.
If you use the cable box/satellite receiver control, check that the control works correctly (see below).



To return to the previous step
Press ↶ RETURN.

Hint
If you want to run Easy Setup again, select “Easy Setup” in the Setup Display (page 95).

Notes
• To record TV programs using the timer, you must set the clock accurately.
• If you use an S-video cord to connect your cable box or satellite receiver, set “Line1 Input” or “Line3 Input” in Video Setup to “S Video” (page 89).

→continued

Checking the cable box/satellite receiver control setting

1 Point the DVD recorder's remote at the recorder (not at the cable box/satellite receiver).

2 Press CH +/– and check that the channel changes on the cable box/satellite receiver window.

3 Press the number buttons and check that the channel changes on the cable box/satellite receiver window.

Tune your cable box to channel 02. Then using your DVD recorder's remote, enter 09 to tune your cable box to channel 09. Did the cable box change to channel 09? If the cable box did not tune to channel 09, follow the instructions below for getting your recorder to control your cable box.

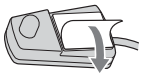
If you cannot get the recorder to control your cable box/satellite receiver

Check the settings at "Set Top Box Control" in Settings Setup (page 86). If more than one code number is listed for your cable box/satellite receiver, try entering them one at a time in step 12 of Easy Setup until you find the one that works with your cable box/satellite receiver.
Check the connection and position of the set top box controller (page 13).
If your cable box or satellite receiver still does not operate with this recorder, contact your cable or satellite company to see if they can provide you with a compatible cable box or satellite receiver.

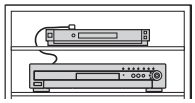
To fix the set top box controller to your cable box/satellite receiver

Once you have confirmed that the set top box controller controls your cable box or satellite receiver, fix it in place.

1 Remove the backing on the double-sided tape.



2 Attach it so that the set top box controller is directly above the remote control sensor on your cable box/satellite receiver.

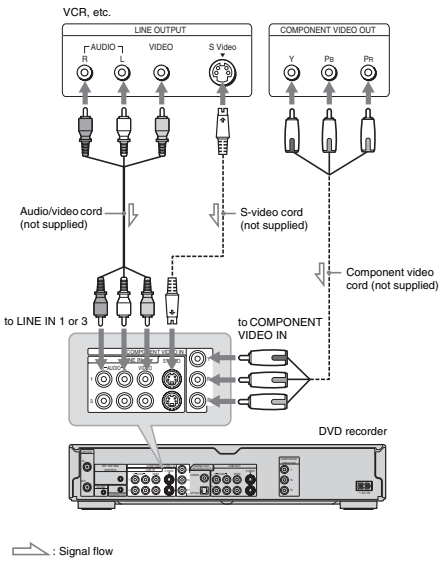


Connecting a VCR or Similar Device

After disconnecting the recorder's power cord from an AC outlet, connect a VCR or similar recording device to the LINE IN jacks of this recorder.
Use the DV IN jack on the front panel if the equipment has a DV/Digital8 output jack (i.LINK jack) (page 77).
See also the instruction manual supplied with the connected equipment.
To record on this recorder, see "Recording From a VCR or Similar Device" (page 53).

Connecting to the LINE IN 1 or 3 jacks

If the equipment has an S-video jack or component output jacks, you can use an S-video cord or component video cord instead of an audio/video cord.



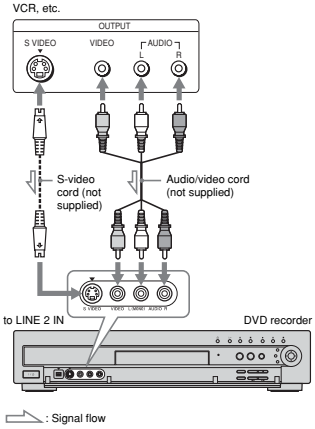
→continued

Notes

- When you connect using a component video cord, connect the audio cords to the LINE IN jacks.
- Do not connect a hi-definition tuner or similar device using the component video cords. This recorder only accepts standard definition interlace signals.

Connecting to the LINE 2 IN jacks on the front panel

Connect a VCR or similar recording device to the LINE 2 IN jacks of this recorder. If the equipment has an S-video jack, you can use an S-video cord instead of an audio/video cord.



Hint

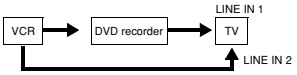
When the connected equipment outputs only monaural sound, use audio cables that distribute monaural sounds to left/right channels (not supplied).

Notes

- Do not connect the yellow LINE IN (VIDEO) jack when using an S-video cord.
- Do not connect the output jack of this recorder to another equipment's input jack with the other equipment's output jack connected to the input jack of this recorder. Noise (feedback) may result.
- Pictures containing copy protection signals that prohibit any copying cannot be recorded.

- If you pass the recorder signals via the VCR, you may not receive a clear image on your TV screen.

Be sure to connect your VCR to the DVD recorder and your TV in the order shown below. To watch videotapes, watch the tapes through a second Line input on your TV.

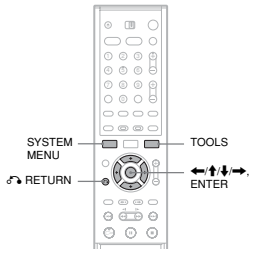


- Do not connect more than one type of video cord between the recorder and your TV at the same time.

Using the On-Screen Menus

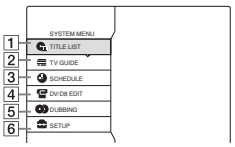
HDD +RW -RWVR -RWVideo +R -R
DVD VCD CD DATA CD

This section introduces the System Menu, TOOLS menu, and sub-menu. By using these displays, you can perform most of the recorder's operations.



System Menu

The System Menu appears when you press SYSTEM MENU, and provides entries to all of the recorder's main functions, such as timer recording and setup.
Select an option by pressing ↑/↓ and ENTER.



1 TITLE LIST (page 37):
Turns on the Title List menu, which shows recorded titles on the disc.

2 TV GUIDE (page 46):
Allows you to set a new timer recording setting using the TV Guide On Screen system.

3 SCHEDULE (page 49):
Turns on the list menu, which allows you to check, change, or cancel timer settings.

4 DV/D8 EDIT (page 77):
Activates the DV Edit function, which allows you to record and edit the contents of a DV/Digital8 format tape.

5 DUBBING (page 72):
Dubs titles from the HDD to a DVD and vice versa. Select the dubbing direction before dubbing.

6 SETUP (page 83):
Turns on the Setup Display, which allows you to set up the recorder to suit your preferences.

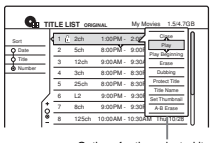
Note

The TV GUIDE option will not contain any listings until the recorder receives the TV Guide On Screen data.

Sub-menu

The sub-menu appears when you select an item from a list menu (e.g. a title from the Title List menu), and press ENTER. The sub-menu displays options applicable only to the selected item. The displayed options differ depending on the situation and disc type.
Select an option by pressing ↑/↓ and ENTER.

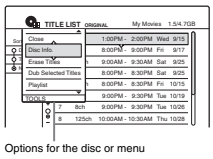
Example: The Title List menu



TOOLS

The TOOLS menu appears when you press TOOLS, and displays options applicable to the entire disc (e.g. disc protection), recorder (e.g. audio settings during recording), or multiple items on a list menu (e.g. erasing multiple titles). The displayed options differ depending on the situation and disc type.
Select the option by pressing ↑/↓ and ENTER.

Example 1: When you press TOOLS while the Title List menu is turned on.

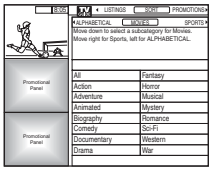


Example 2: When you press TOOLS while a DVD-RW (VR mode) is playing.

To return to the previous display
Press ↩ RETURN.

Using the TV Guide On Screen System

The TV Guide On Screen system automatically displays a free television program list. This list displays the program name, promotions and related information for programs being broadcast up to eight days in advance, and for a maximum of 120 channels. TV Guide On Screen data for the television program listing is carried by local broadcast stations and is received through your antenna or cable box.



These are just a few of the ways to use the TV Guide On Screen system.
– Search for a program by listing them according to category, such as Movies or Sports, or in alphabetical order.
– Once you have found the program you are looking for, use the TV Guide On Screen system to set the timer for recording (page 46).
– If you find a program that you want to watch in the future, set it as a Favorite. You can later tune in to that program directly by pressing the blue button on the remote when the program begins broadcasting.

For more information, see "Navigating the TV Guide On Screen system" (page 34).

→continued

Troubleshooting guide

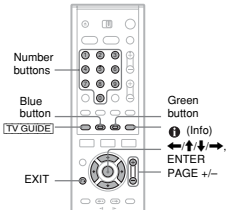
If you are having trouble displaying the television program list, please check the following.
– This recorder downloads the TV Guide On Screen data several times a day when the recorder is turned off. Turn off the recorder when you are not using it (for example, at night). It may take up to 24 hours for your recorder to start receiving program listings.
– When the recorder is connected to a cable box, the cable box must be turned on, the set top box controller must be connected, and "Set Top Box Control" in the Settings setup must be set to "On" (page 86) to download the TV Guide On Screen data.
– Your area of residence and zip code must be set correctly (page 85).
– The time must be set correctly. If the time is not set, set it manually (page 86).
– The television program list is blank when TV Guide On Screen data is being downloaded or a satellite or terrestrial digital tuner is in use.

You may be asked to select a channel lineup the first time you press TV GUIDE. Select one of the available channel lineups. If the channel number in the program listing does not match the broadcast station, see "To match the channel number with the broadcast station" (page 36).

Notes

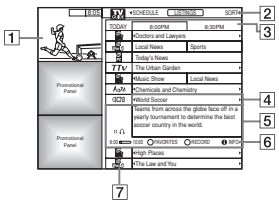
- Only English is displayed in the TV Guide On Screen system.
- The TV Guide On Screen system is not compatible with satellite and terrestrial digital broadcasts.
- Your cable box's channel may suddenly change even if the recorder is turned off. This is because the set top box control has changed the channel to receive the TV Guide On Screen data.

Navigating the TV Guide On Screen system



1 Press TV GUIDE.
TV Guide On Screen appears.

2 Press ←/↑/↓/→ to move the cursor around the entire TV Guide On Screen system, and press ENTER to make a selection.
Example: LISTINGS



1 Picture in Guide: This shows the last program you were watching. See "To lock the Picture in Guide" (page 36) to prevent the picture from changing when you move the cursor.

2 Main Menu Bar: Use ←/→ to select one of the following features and press ENTER.
"LISTINGS": Shows the current programs for the selected time slot.
"SORT": Allows you to sort titles alphabetically or by category (movies, sports, children's, educational, news, variety, series).
"PROMOTIONS": Shows just promotions. Select a promotion and press the (info) button.
"SETUP": Allows you to change the TV Guide On Screen system settings and channel lineup.
"MESSAGES": Displays messages and information such as the TV Guide ID Number. To delete unwanted messages, press the green button.
"SCHEDULE": Displays either the RECORD list or the FAVORITES list. Press ENTER and use ←/→ to switch between the lists.

3 Time Slot: Indicates the currently selected time slot. Use ←/→ to select a different time slot.

4 Program Title: Gives the program title. The program's category is also indicated by color: green (sports), purple (movies), blue (children's), teal (others).

5 Info. Box: Shows information about the selected program and displays the following icons.
"®"indicates that the program is set to be recorded.
"♡"indicates that the program is set as a Favorite.
"∩"indicates that the program is in stereo.
"CC"indicates that the program is closed captioned.
Press the (info) button repeatedly to show extended information about the program.

6 Action Bar: Shows buttons that can be used on the remote with the current selection. For example, when a program is selected, press blue to add the program to the FAVORITES list, or green to add the program to the RECORD list.

7 Channel Logo: Shows the broadcast station logo.

To select a program (Direct Tuning)

1 Select "LISTINGS" in the Main Menu Bar and press ENTER.

2 Press ↑/↓ to select a program and press ENTER.
The TV Guide On Screen system disappears and the channel changes to the selected program.
You can also use the number buttons (Direct Dialing) to select a program. When "LISTINGS" is selected, enter the channel number of the program you want to watch using the number buttons on the remote, then press ENTER.

To find a program alphabetically or by category

1 Select "SORT" in the Main Menu Bar and press ENTER.

2 Press ←/→ to select the main category.
To sort alphabetically, select "ALPHABETICAL."

3 Press←/↑/↓/→ to select the sub-category (or a letter if you are sorting alphabetically), and press ENTER.

4 Press ↑/↓ to select a program and press ENTER.

To set a program as a "Favorite"

If you find a program that you want to watch in the future, set it as a Favorite by pressing the blue button. "♡" appears next to the program.
To customize the "Favorite" setting, press the green button. The settings change as follows:
♡: Registers the program as a "Favorite."
♡: Registers a regularly scheduled program as a "Favorite."
♡: Registers the program as a weekly "Favorite."
∅: Temporarily turns off the "Favorite" setting.
To view the programs you have set a "Favorite," select "SCHEDULE" in the Main Menu Bar and press ENTER. Then press ←/→ to select "FAVORITES."

To watch a "Favorite" program

When you are watching TV, press the blue button on the remote when the broadcasting time for that program arrives. If more than one program is registered as a "Favorite" in the same time slot, press the blue button repeatedly to switch between the programs.

To set a program for timer recording

See "Recording using the TV Guide On Screen system (TV GUIDE)" (page 46).

→continued

To lock the Picture in Guide

You can lock the Picture in Guide so that it does not change when you move the cursor across other titles.
Select the logo of the channel that you want to lock from LISTINGS and press the blue button. Press the blue button again to unlock the channel.

To customize the channel line-up

1 Select “SETUP” in the Main Menu Bar and press ENTER.

2 Press ↑/↓ to select “Change channel display” and press ENTER.

3 Press ↑/↓ to select a channel and perform one of the following.

◆To hide the channel
Press the green button.

◆To change the channel number
Enter the new channel number using the number buttons.

◆To change the order of the channels
Select channel you want to move and press ← to highlight the channel logo. Press the blue button to move the channel up, or press the green button to move the channel down.

To match the channel number with the broadcast station

If the channel number in the program listing does not match the broadcast station, there may be more than one channel lineup for your area. To change the channel lineup, select “Change channel lineup” from “SETUP” and press ENTER. Then select a different channel lineup, if available.

To turn off the TV Guide On Screen system

Press TV GUIDE or EXIT on the remote.

Hints

- Press the PAGE +/– buttons to change the program list by page.
- Each time you turn on the power, the TV Guide On Screen system automatically appears on your TV screen. To turn off this function, select “SETUP” from the Main Menu Bar, and then select “Review options.” Then select “Off” and press ENTER.

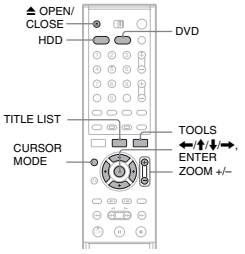
Notes

- Programs that contain copy protection signals do not appear in the Picture in Guide.
- The Picture in Guide is locked during recording and the lock indicator appears in the Picture in Guide window. You cannot unlock the Picture in Guide during recording.
- If you are watching programs through a set top box, the Picture in Guide may not change as fast as you move the cursor. In this case, lock the Picture in Guide (page 36).
- When you turn on the recorder, the same channel that you were watching last will automatically appear, even if you should change the channel on your set top box while the recorder’s power is off.
- The screen saver will not appear with the TV Guide On Screen system. The TV Guide On Screen system will simply turn off if no buttons are pressed for more than five minutes.

Using the Title List

HDD +RW -RWVR -RWVideo +R -R

The titles of programs recorded on a disc are displayed in the Title List.

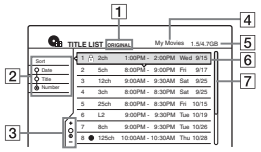


1 Press HDD or DVD.
If you select DVD, press ≜ OPEN/CLOSE and place a DVD on the disc tray. Press ≜ again to close the disc tray.

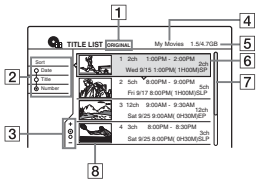
Wait until “LOAD” disappears from the front panel display.

2 Press TITLE LIST.
To show the list in greater detail (zoom), press ZOOM+.

Standard Title List (Example: DVD-RW in VR mode)



“Zoomed” Title List



1 Disc type:
Displays a media type, HDD or DVD. Also displays the title type (Original or Playlist) for DVD-RWs (VR mode).

2 Sort buttons:
Sorts the title order (see below).

3 Zooming indicator:
Shows the current zoom status.

4 Disc name (DVD only) (page 40)

5 Disc space (remainder/total)

6 Title information:
Displays the title number, title name, and recording date.
● (red): Indicates that the title is currently being recorded.
: Indicates that the title is currently being dubbed.
: Indicates the protected title.
“NEW”: Indicates that the title is newly recorded (not played back) (HDD only).

→continued

7 Scroll bar:
Appears when all of the titles do not fit on the list. To view the hidden titles, press ↑/↓.

8 Title’s thumbnail picture

To scroll the list display by page (Page mode)

Press CURSOR MODE while the list display is turned on. The display enters Page mode. Each time you press ↑/↓, the entire Title List changes to the next/previous page of titles.
To return to the Cursor mode, press CURSOR MODE again.

About the Title List for DVD-RWs (VR mode)

You can switch the Title List to show Original or Playlist.
While the Title List menu is turned on, press TOOLS and select either “Original” or “Playlist,” and press ENTER. “PLAYLIST” appears on the front panel display when “Playlist” is selected. For details, see “Edit options for DVD-RWs (VR mode)” (page 64).

To change the title order (Sort)

Press ← while the Title List menu is turned on to move the cursor to the Sort column. Press ↑/↓ to select the item, and press ENTER.

Order	Sorted
New (HDD only)	in order of when the titles were recorded. The title that is recorded most recently and not played back is listed at the top.
Date	in order of when the titles were recorded. The title that is recorded most recently is listed at the top.
Title	in alphabetical order.
Number	in order of recorded title number.

To change a title thumbnail picture (Thumbnail) (HDD/DVD-RW (VR mode) only)

You can select a favorite scene for the thumbnail picture shown in the Title List menu.

1 Press TITLE LIST while a disc is in the recorder, and press ZOOM+.

2 Select a title whose thumbnail picture you want to change, and press ENTER.

3 Select “Set Thumbnail” from the sub-menu, and press ENTER.
The selected title starts to play in the background.

4 While watching the playback picture, press ▷ PLAY, ❚❚ PAUSE, or ◀◀/▶▶ to select the scene you want to set for a thumbnail picture, and press ENTER.
The scene is set for the title’s thumbnail picture.

To turn off the Title List

Press TITLE LIST.

Hint

After recording, the first scene of the recording (the title) is automatically set as the thumbnail picture.

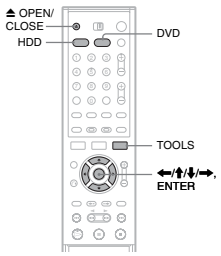
Notes

- The Title List may not appear for DVDs created on other DVD recorders.
- Letters that cannot be displayed are replaced with “•.”
- Title thumbnail pictures are displayed only on this recorder.
- It may take a few seconds for the thumbnail pictures to be displayed.
- After editing, the title thumbnail picture may change to the first scene of the recording (title).
- After dubbing, the title thumbnail picture set on the source recording is canceled.

Using the “Disc Info” Screen (disc settings)

HDD +RW -RWVR -RWVideo +R -R

With the Disc Information display, you can check the disc type and remaining disc space. Also, you can perform operations such as formatting and finalizing (page 40).



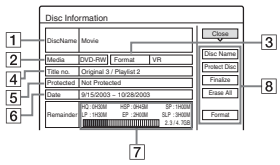
1 Press HDD or DVD.
If you select a DVD, press ≜ OPEN/CLOSE and place a DVD on the disc tray. Press ≜ again to close the disc tray.

Wait until “LOAD” disappears from the front panel display.

2 Press TOOLS.
The TOOLS menu appears.

3 Select “Disc Info.,” and press ENTER.
Items in the display differ depending on the disc type or recording format.

Example: DVD-RW (VR mode)



1 “Disc Name” (DVD only)

2 “Media”: Disc type

3 “Format”: Recording format type (HDD/DVD-RW only)

4 “Title no.”: Total number of titles

5 “Protected”: Indicates whether protection is set (DVD-RW in VR mode only)

6 “Date”: Dates of when the oldest and the most recent titles were recorded (DVD only)

7 “Continuous Rem. Time”/“Remainder” (approximate)
- The longest continuous recording time in each of the recording modes
- Disc space bar
- Remaining disc space/total disc space

8 Disc setting buttons (page 40)
- “Disc Name”
- “Protect Disc”
- “Finalize”/“Unfinalize”
- “Erase All”
- “Format”

Available settings differ depending on the disc type.

Hint

For DVD+RWs and DVD-RWs (Video mode), you can check free space and title location on the disc using the Disc Map display (page 67).

Note

On this model, 1 GB (read “gigabyte”) is equivalent to 1 billion bytes. The larger the number, the larger the disc space.

→continued

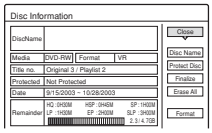
Labeling, protecting, or formatting a disc

HDD +RW -RWVR -RWVideo +R -R

You can execute options effective for the entire disc using the Disc Information display.

1 Press TOOLS while the disc is in the recorder.
The TOOLS menu appears.

2 Select "Disc Info.," and press ENTER.
Example: When the inserted disc is a DVD-RW (VR mode).



3 Select an option, and press ENTER.
"Disc Name" (DVD only): Labels a DVD. Enter the disc name in the "Input Disc Name" display (page 43).
"Protect Disc" (DVD-RW in VR mode only): Protects all titles on the disc. To cancel the protection, select "Don't Protect."
"Erase All" (HDD/DVD+RW/DVD-RW only): Erases all titles on the disc (except the protected titles).
"Format" (HDD/DVD+RW/DVD-RW only): Erases all contents. For DVD-RWs, select a recording format (VR or Video) according to your needs.

Hints
- You can set protection for individual titles (page 65).
- By reformatting, you can change the recording format on DVD-RWs, or record again on DVD-RWs (Video mode) that have been finalized.

Note
You can enter up to 64 characters for a DVD disc name. The disc name may not appear when the disc is played on other DVD equipment.

Finalizing a disc (preparing a disc for playback on other equipment)

+RW -RWVR -RWVideo +R -R

Finalizing is necessary when you play discs recorded with this recorder on other DVD equipment.
When you finalize a DVD+RW, DVD-RW (Video mode), DVD+R, or DVD-R, a DVD menu will be automatically created, which can be displayed on other DVD equipment.
Before finalizing, check the differences between the disc types in the table below.

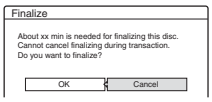
Differences between the disc types

+RW	Discs are automatically finalized when removed from the recorder. However, you may need to finalize the disc for certain DVD equipment, or if the recording time is short. You can edit or record on the disc even after finalizing.
-RWVR	Finalizing is unnecessary when playing a disc on VR format compatible equipment. Even if your other DVD equipment is VR format compatible, you may need to finalize the disc, especially if the recording time is short. You can edit or record on the disc even after finalizing.
-RWVideo	Finalizing is necessary when playing on any equipment other than this recorder. After finalizing, you cannot edit or record on the disc. If you want to record on it again, reformat the disc (page 40). However, all recorded contents will be erased.
+R -R	Finalizing is necessary when playing on any equipment other than this recorder. After finalizing, you cannot edit or record on the disc.

1 Press TOOLS while the disc is in the recorder.
The TOOLS menu appears.

2 Select "Disc Info.," and press ENTER.
The Disc Information display appears.

3 Select "Finalize," and press ENTER.
The display shows the approximate time required for finalizing and asks for confirmation.



4 Select "OK," and press ENTER.
The recorder starts finalizing the disc.

To unfinalize a DVD-RW (VR mode)
If you cannot record or edit on a DVD-RW (VR mode) that has been finalized with other DVD equipment (a message appears), unfinalize the disc by selecting "Unfinalize" in step 3 above.

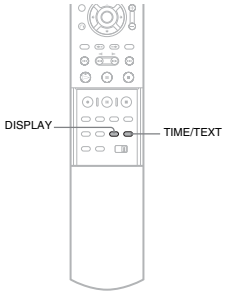
Hint
You can check whether the disc has been finalized or not. If you cannot select "Finalize" in step 3 above, the disc has already been finalized.

Notes
- Depending on the condition of the disc, recording, or the DVD equipment, discs may not play even if the discs are finalized.
- The recorder may not be able to finalize the disc if it was recorded on another recorder.

Checking the Play Information and Playing Time

HDD +RW -RWVR -RWVideo +R -R
DVD VCD CD DATA CD

You can check the playing time and remaining time of the current title, chapter, or track. Also, you can check the disc name recorded on the DVD/CD.

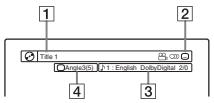


Press DISPLAY repeatedly.
Each time you press the button, the display changes as follows:

Title/track information (Display 1)
↓
Play mode/time information (Display 2)
↓
(Display off)

The displays differ depending on the disc type or playing status.

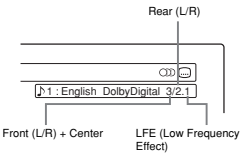
◆ Display 1
Example: When playing a DVD VIDEO



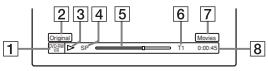
→continued

1 Title number/name
(Track number for CDs/VIDEO CDs without PBC, scene number for VIDEO CDs with PBC, track number/name for DATA CDs)
2 Available functions for DVD VIDEOs (angle/audio/subtitle, etc.)
3 The current selected function or audio setting (appears only temporarily)
4 The current selected angle

Example: Dolby Digital 5.1 ch



◆ Display 2
Example: When playing a DVD-RW (VR mode)



1 Disc type*2/format (page 8)
2 Title type (Original or Playlist) (page 64)
3 Play mode
4 Recording mode (page 45)
5 Playing status bar*3
6 Title number (chapter number*1) (page 61)
(Track number for CDs/VIDEO CDs without PBC, scene number for VIDEO CDs with PBC, track number (album number*1) for DATA CDs)
7 CD text (album name) appears when text is recorded on a CD.
8 Playing time (remaining time*1)

*1 Displayed when you press TIME/TEXT repeatedly.
*2 Displays Super VCDs as "SVCD", DATA CDs as "CD".
*3 Does not appear with VIDEO CDs, or DATA CDs.

Hints
- If "DTS" is set to "Off" in Audio Setup, the DTS track selection option will not appear on the screen even if the disc contains DTS tracks (page 90).
- When "Auto Display" is set to "On" (default) in Options Setup (page 94), playback information automatically appears when the recorder is turned on, etc.

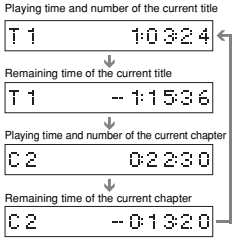
Notes
- The recorder can only display the first level of a CD's text, such as the disc name.
- The letters or symbols that cannot be displayed are replaced with "*."

Checking the playing/remaining time

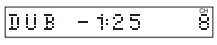
You can view the playing or remaining time information displayed on the TV screen and the front panel display.

Press TIME/TEXT repeatedly.
The displays differ depending on the disc type or playing status.

◆Front panel display
Example: When playing a DVD


Playing time and number of the current title
T1 1:03:24
Remaining time of the current title
T1 -1:15:36
Playing time and number of the current chapter
C2 0:22:30
Remaining time of the current chapter
C2 -0:13:20

Example: When dubbing a DVD



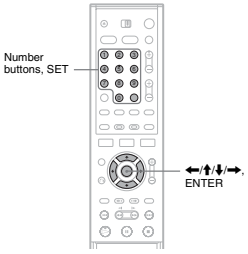
Example: When playing a CD

Track playing time and the current track/index number
↓
Remaining time of the current track
↓
Playing time of the disc
↓
Remaining time of the disc
↓
CD text (when available)

Notes
- The recorder can only display the first level of a CD's text, such as the disc name.
- The letters or symbols that cannot be displayed are replaced with "*."
- Playing time of MP3 audio tracks may not be displayed correctly.

How to Enter Characters

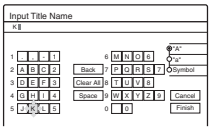
You can label a title, disc, or program by entering characters. You can enter up to 64 characters for a title or disc name, but the actual number of characters displayed in the menus such as the Title List will vary. When the display for entering characters appears, follow the steps below.



1 Press ←/↑/↓/→ to move the cursor to the right of the screen and select "A" (upper-case), "a" (lower-case), or "Symbol," and press ENTER.
The characters of the selected type are displayed.

2 Press ←/↑/↓/→ to select the character you want to enter, and press ENTER.
The selected character appears at the top of the display.

Example: Input Title Name



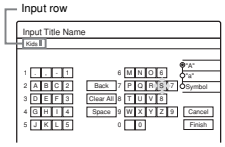
The type of characters will change according to the language you select in Easy Setup. Some languages allow you to enter an accent mark.

→continued

To enter a letter with an accent mark, select an accent followed by the letter.
Example: Select “ ` ” and then “a” to enter “à.”

To insert a space, select “Space.”

3 Repeat steps 1 and 2 to enter the remaining characters.



To erase a character, move the cursor to the right of the character at the input row. Select “Back” and press ENTER.

To insert a character, move the cursor to the right of the point where you want to insert the character. Select the character and press ENTER.

To erase all of the characters, select “Clear All” and press ENTER.

4 Select “Finish,” and press ENTER.
To cancel the setting, select “Cancel.”

To use the number buttons
You can also use the number buttons to enter characters.

1 In step 2 above, press the number buttons repeatedly to select a character.
Example:
Press the number 3 button once to enter “D.”
Press the number 3 button three times to enter “F.”

2 Press SET and select the next character.

3 Select “Finish” and press ENTER.

Unrecordable pictures

Pictures with copy protection cannot be recorded on this recorder.
When the recorder receives a copy guard signal, the recorder continues to record but only a blank, gray colored screen will be recorded.

Copy control signals	Recordable discs
Copy-Free	HDD +RW -RWVR -RWVideo +R -R
Copy-Once	HDD -RWVR (Ver.1.1 with CPRM*)
Copy-Never	None (a blank screen is recorded)

* The recorded disc can be played only on CPRM compatible equipment.

Note
Copy-Once programs can not be dubbed (page 73).

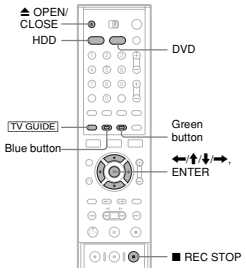
Timer Recording (TV GUIDE/ Manual/VCR Plus+)

There are three methods to set the timer – setting the timer using the TV Guide On Screen system, using VCR Plus+ and setting the timer manually.

Notes
- When the recorder is connected to a cable box and you want to record using the TV Guide On Screen system, do the following: Turn on the cable box, connect the set top box controller, and set “Set Top Box Control” in the Settings setup to “On.”
- Do not operate your cable box or satellite receiver just before or during a timer recording. This may prevent the accurate recording of a program.

Recording using the TV Guide On Screen system (TV GUIDE)

You can use the TV Guide On Screen system to set the timer to record a program up to eight days in advance.

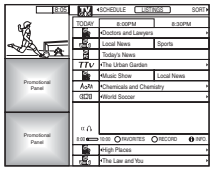


1 Press HDD or DVD.
If you select DVD, press ⏏ OPEN/CLOSE and place a DVD on the disc tray. Press ⏏ again to close the disc tray.

With the recording side facing down

Wait until “LOAD” disappears from the front panel display.
Unused DVDs are formatted automatically.

2 Press TV GUIDE.



3 Press ←/↑/↓/→ to select a program.
To search for a program alphabetically or by category, select “SORT” in the Main Menu Bar. See “Using the TV Guide On Screen system” for more information about navigating the TV Guide On Screen system (page 33).

4 Press the green button.
Ⓡ appears next to the program. Each time you press the blue button, the timer recording changes as follows.
Ⓡ: the program is recorded once.
Ⓡ: the program is recorded on a regular basis.
Ⓡ: the program is recorded weekly.
Ⓡ: the timer recording is temporarily put on hold without canceling the setting.

5 Press TV GUIDE.
The TIMER REC indicator lights up on the front panel display and the recorder is ready to start recording. When recording from a cable box, be sure to turn it on.
Unlike a VCR, there is no need to turn off the recorder before the timer recording starts.

To confirm, change, or cancel a timer recording
See “Checking/Changing/Canceling Timer Settings” (page 49).

To stop recording during timer recording
Open the remote’s cover and press ■ REC STOP. Note that it may take a few seconds for the recorder to stop recording.

To adjust the recording quality
See step 3 of “Checking/Changing/Canceling Timer Settings”(page 49).

Rec Mode Adjust
If there is not enough available disc space for the recording, the recorder automatically adjusts the recording mode to enable the entire program to be recorded. Set “Rec Mode Adjust” in Features Setup to “On” (page 93).

Auto Title Erase (HDD only)
If there is not enough space for a timer recording, the recorder automatically erases old titles recorded on the HDD.
Set “Auto Title Erase” in Features Setup to “On” (page 93). The oldest, played title is erased. The protected titles are not erased.

If the timer settings overlap
If one or more timer settings overlap, Ⓡ appears next to the program and the recording is suspended. The timer recording resumes its original status when the overlap condition no longer exists. To change the timer settings, see “Checking/Changing/Canceling Timer Settings” (page 49).

Notes
- Check to see that there is enough available space for the recording (DVD+RW/DVD-RW only) (page 67). Note that recordings made with the TV Guide On Screen system require one extra minute of recording time.
- The Rec Mode Adjust function only works with a timer recording. It does not function with Quick Timer (page 51).
- You cannot adjust the recording quality or recording destination once the recording starts.

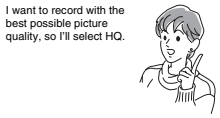
Before Recording

Before you start recording…
- This recorder can record on various discs. Select the disc type according to your needs (page 8).
- Check that the disc has enough available space for the recording (page 39). For HDD, DVD+RWs, and DVD-RWs, you can free up disc space by erasing titles (page 67).
- Adjust the recording picture quality and picture size if necessary (page 51).

Hint
Timer recordings will be made regardless whether or not the recorder is turned on. You can turn off the recorder without affecting the recording even after recording starts.

Recording mode

Like the SP or LP recording mode of VCRs, this recorder has six different recording modes. Select a recording mode according to the time and picture quality you need. For example, if picture quality is your top priority, select the High Quality mode (HQ). If recording time is your priority, Super Long Play mode (SLP) can be a possible choice. Note that recording times in the following table are approximate and the actual times may differ. Note also that the maximum continuous recording time for a single title is eight hours (HDD), or six hours (DVD). Contents beyond this time will not be recorded.
Press REC MODE repeatedly to switch the recording modes.



Recording mode	Recording time (hour)	
	HDD	DVD
HQ (High quality)	33	1
HSP ↑	51	1.5
SP (Standard mode)	67	2
LP ↓	103	3
EP ↓	137	4
SLP (Long duration)	204	6

“HQ+” recording mode
“HQ+” records pictures in higher quality than HQ on the HDD. Set “HQ Setting” in Features Setup to “HQ+” (page 93). Maximum recording time is 21 hours. “HQ” appears in the display.

Note
Situations below may cause slight inaccuracies with the recording time.
– Recording a program with poor reception, or a program or video source of low picture quality
– Recording on a disc that has already been edited
– Recording only a still picture or just sound

Recording a stereo/SAP program

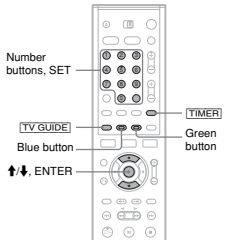
The recorder can receive and record stereo/SAP programs.

Stereo programs
When a stereo program is received, the “STEREO” indicator lights up on the front panel display. If there is noise in the stereo program, set “Auto Stereo” in Audio Setup to “Off” (page 89). The sound will be recorded in monaural but with less noise.

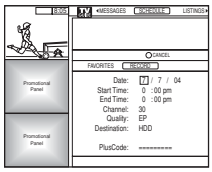
SAP (Second Audio Program)
When a SAP (Second Audio Program) is received, the “SAP” indicator lights up on the front panel display. To record only SAP sound, set “Tuner Audio” in Audio Setup to “SAP” (page 89).

Setting the timer manually or using the VCR Plus+ system (Manual/VCR Plus+)

You can set the timer for a total of 30 programs.



1 Press TIMER.



2 Press ↑/↓ to select an item.

"Date": Press the number buttons to enter month, day, and year.
"Start Time"/"End Time": Press the number buttons to enter the time. To change am/pm, select "am" or "pm," and press the blue button.
"Channel": If you are using the set top box control, press the number buttons to enter the channel. If not, select LINE 1, 2, or 3 using the blue button, whichever your box is connected to, and select the channel you want to record on the set top box.
"Quality": Press the blue button to change the recording mode.
"Destination": Press the blue button to switch between HDD and DVD.
"PlusCode": Press the number buttons. To correct the number, press ↑/↓ and enter the number again.

3 Press ENTER.

To make another timer setting, select "RECORD" and repeat from step 3.

4 Press TV GUIDE.

The TIMER REC indicator lights up on the front panel display and the recorder is ready to start recording. When recording from a cable box or satellite tuner, be sure to turn it on. Unlike a VCR, there is no need to turn off the recorder before the timer recording starts.

To confirm, change, or cancel a timer recording

See "Checking/Changing/Canceling Timer Settings" (page 49).

To stop recording during timer recording

Open the remote's cover and press ■ REC STOP. Note that it may take a few seconds for the recorder to stop recording.

Rec Mode Adjust

If there is not enough available disc space for the recording, the recorder automatically adjusts the recording mode to enable the entire program to be recorded. Set "Rec Mode Adjust" in Features Setup to "On" (page 93).

Auto Title Erase (HDD only)

If there is not enough space for a timer recording, the recorder automatically erases old titles recorded on the HDD.
Set "Auto Title Erase" in Features Setup to "On" (page 93). The oldest, played title is erased. The protected titles are not erased.

If the timer settings overlap

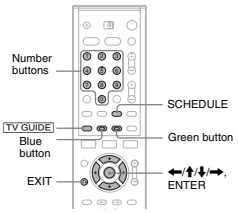
If one or more timer settings overlap, ⓜ appears next to the program and the recording is suspended. The timer recording resumes its original status when the overlap condition no longer exists. To change the timer settings, see "Checking/Changing/Canceling Timer Settings" (page 49).

Notes

- Check to see that there is enough available space for the recording (DVD+RW/DVD-RW only) (page 67).
- To record a cable or satellite program without using cable box/satellite box control, turn on the cable box or satellite receiver and select the program you want to record. Leave the cable box or satellite receiver turned on until the recorder finishes recording.
- The Rec Mode Adjust function only works with a timer recording. It does not function with Quick Timer (page 50).
- You cannot adjust the recording quality or recording destination once the recording starts.

Checking/Changing/ Canceling Timer Settings

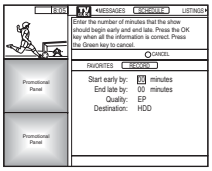
You can check, change or cancel timer settings using the SCHEDULE list, even while a recording is in progress.



1 With the TV Guide On Screen system turned off, press SCHEDULE.

The SCHEDULE list appears.

2 Press ↑/↓ to select the program you want to change, then press ENTER.


MESSAGES
SCHEDULE
LISTINGS
Enter the number of minutes that the show should begin early and end late. Press the OK key when all the information is correct. Press the Green key to cancel.
CANCEL
FAVORITES
RECORD
Promotional Panel
Start early by: 00 minutes
End late by: 00 minutes
Quality: EP
Destination: HDD

3 Press ↑/↓ to select the item you want to adjust.

"Start early by": Press the number buttons to start the recording by up to 99 minutes in advance.
"End late by": Press the number buttons to extend the recording by up to 99 minutes.
"Quality": Press the blue button to change the recording mode.
"Destination": Press the blue button to switch between HDD and DVD.

4 Press TV GUIDE.

→continued

To change the recording frequency

Press SCHEDULE and select the program you want to change. Then press the green button repeatedly to change the recording frequency. Programs set to be recorded "Daily" will only be recorded from Monday through Friday.

To cancel the timer setting

Press SCHEDULE and select the program you want to cancel. Then press the blue button.

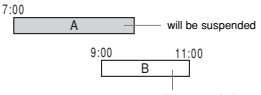
To turn off the SCHEDULE list

Press EXIT.

If two or more timer settings overlap

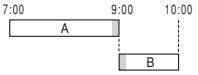
The timer recording set last has priority over the other settings and is recorded. All other overlapped settings are suspended, even if the setting only partially overlaps the setting with priority. ⓜ appears next to programs that are suspended.

Example: You set the timer in order of A, and then B.



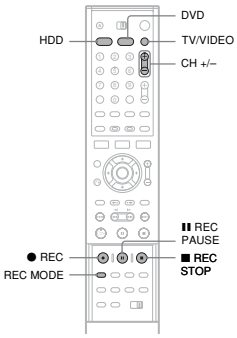
If the end and start time of two timer settings are the same

The end of program A or the beginning of program B will be cut.



Recording Without the Timer

HDD +RW -RWVR -RWVideo +R -R



1 Press HDD or DVD to select a media.

When you selected DVD, insert a recordable DVD.

2 Press CH +/– to select the channel or input source you want to record.

3 Press REC MODE repeatedly to select the recording mode.

Each time you press the button, the display changes on the TV screen as follows:

HQ → HSP → SP → LP → EP → SLP

For more details about the recording mode, see page 45.

4 Press ● REC.

Recording starts.
Recording continues until you stop the recording or the disc is full.

To stop recording

Press ■ REC STOP located beneath the remote control cover. Note that it may take a few seconds for recording to stop.

To pause recording

Press ❚❚ REC PAUSE located beneath the remote control cover. To restart recording, press the button again.

To watch another TV program while recording

Set your TV to the TV input using the TV/VIDEO button.

Hint

If you do not want to watch TV while recording, you can turn off the TV. When using a cable box, make sure to leave it on.

Notes

- After pressing ● REC, it may take a short while to start recording.
- You cannot change the recording mode while recording or during recording pause.
- If there is a power failure, the program you are recording may be erased.
- You cannot watch a TV program while recording another TV program.

Using the Quick Timer function

You can set the recorder to record in 30 minute increments.

Press ● REC repeatedly to set the duration.

Each press advances the time in 30 minute increments. The maximum duration is six hours.

0:30 → 1:00 → - - → 5:30 → 6:00 → (normal recording)

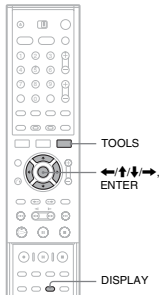
The time counter decreases minute by minute to 0:00, then the recorder stops recording (power does not turn off). Even if you turn off the recorder during recording, the recorder continues to record until the time counter runs out.

To cancel the Quick Timer

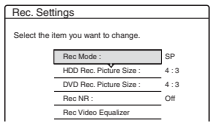
Press ● REC repeatedly until the counter appears in the front panel display. The recorder returns to normal recording mode.

Adjusting the recording picture quality and size

You can adjust the recording picture quality and picture size.



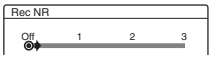
1 Before recording starts, press TOOLS and select "Rec Settings." Then press ENTER.


Rec. Settings
Select the item you want to change.
Rec Mode : SP
HDD Rec. Picture Size : 4 : 3
DVD Rec. Picture Size : 4 : 3
Rec NR : Off
Rec Video Equalizer

2 Select the item you want to adjust, and press ENTER.

The adjustment display appears.

Example: Rec NR



"Rec Mode": Selects the recording mode for the desired recording time and picture quality. For more information, see "Recording mode" (page 45).

→continued

"HDD Rec. Picture Size"/"DVD Rec. Picture Size": Sets the picture size of the program to be recorded.
- 4:3 (default): Sets the picture size to 4:3.
- 16:9: Sets the picture size to 16:9 (wide mode).
- Auto (HDD only): Automatically selects the actual picture size.

"DVD Rec. Picture Size" works with DVD-Rs and DVD-RWs (Video mode) when the recording mode is set to HQ, HSP, or SP. For all other recording modes, the screen size is fixed at "4:3."
For DVD-RWs (VR mode), the actual picture size is recorded regardless of the setting. For example, if a 16:9 size picture is received, the disc records the picture as 16:9 even if "Rec Screen Size" is set to "4:3."
For DVD+RWs/DVD+Rs, the screen size is fixed at "4:3."

"Rec NR" (noise reduction): Reduces noise contained in the video signal.

"Rec Video Equalizer": Adjusts the picture in greater detail.
Press ↑/↓ to select the item you want to adjust, then press ENTER.
- Contrast: Changes the contrast.
- Brightness: Changes the overall brightness.
- Color: Makes the colors deeper or lighter.
- Hue: changes the color balance.

3 Adjust the setting using ←/↑/↓/→, and press ENTER.
The default setting is underlined.
"Rec NR": (weak) Off 1 ~ 3 (strong)
"Rec Video Equalizer":
- Contrast: (weak) –3 ~ 0 ~ 3 (strong)
- Brightness: (dark) –3 ~ 0 ~ 3 (bright)
- Color: (light) –3 ~ 0 ~ 3 (deep)
- Hue: (red) –3 ~ 0 ~ 3 (green)

Repeat steps 2 and 3 to adjust any other items.

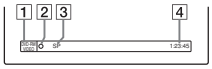
Notes
- If one program contains two picture sizes, the selected size is recorded. However, if the 16:9 signal cannot be recorded as 16:9, it is recorded as 4:3.
- When playing a 16:9 size picture recorded as 4:3, the image is fixed to 4:3 letter box regardless of the setting in "TV Type" of Video Setup (page 87).
- Remnants of images may appear on your screen when using "Rec NR."

- You cannot use these settings for video signals from the DV IN jack and COMPONENT VIDEO IN jacks.

Checking the disc status while recording

You can check the recording information such as recording time or disc type.

Press DISPLAY twice during recording.
The recording information appears.



1 Disc type/format
2 Recording status
3 Recording mode
4 Recording time

Press DISPLAY to turn off the display.

Creating chapters in a title

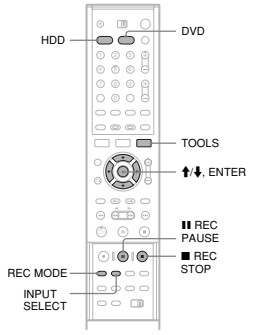
The recorder will automatically divide a recording (a title) into chapters by inserting chapter marks at 6 or 15 minute intervals during recording. Select the interval, "6Min" (default) or "15Min" in "Auto Chapter" of Features Setup (page 91).

Hint
You can create chapters manually when playing DVD-RWs (VR mode). For details, see page 68.

Recording From a VCR or Similar Device

HDD +RW -RWVR -RWVideo +R -R

You can record from a connected VCR or similar device. To connect a VCR or similar device, see "Connecting a VCR or Similar Device" (page 29). Use the DV IN jack on the front panel if the equipment has a DV output jack (i.LINK jack).



1 Press HDD or DVD.
If you select DVD, insert a recordable DVD.

2 Press INPUT SELECT to select an input source according to the connection you made.
The front panel display changes as follows:

Channel number* → L1 → L2 → L3 → DV

* Does not appear when "Set Top Box Control" is set to "On."

3 Press REC MODE repeatedly to select the recording mode.
The recording mode changes as follows:

HQ → HSP → SP → LP → EP → SLP

4 Press TOOLS and select "Line Audio Input." Then press ENTER.
"Main/Sub": Records two different sound tracks when recording to the HDD or to a DVD-RW (VR mode).

"Stereo" (default): Records stereo sound only. Select this when recording to discs other than the HDD or DVD-RWs (VR mode).

5 Press II REC PAUSE to set this recorder to record pause.

6 Insert the source tape into the connected equipment and set to playback pause.

7 At the same time, press II REC PAUSE on this recorder and the pause or play button on the connected equipment.
Recording starts.
To stop recording, press ■ REC STOP on this recorder.

If you connect a digital video camera with a DV IN jack

See "DV/Digital8 Dubbing (DV → HDD/DVD)" (page 77) for an explanation of how to record from the DV IN jack.

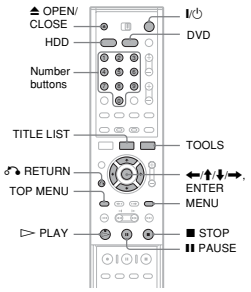
Hint
You can adjust the settings for the recording picture before recording. See "Adjusting the recording picture quality and size" (page 51).

Notes
- When recording a video game image, the screen may not be clear.
- Any program that contains a Copy-Never copy guard signal cannot be recorded. The recorder continues to record, but a blank screen will be recorded.

Playback

Playing

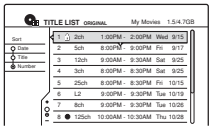
HDD +RW -RWVR -RWVideo +R -R
DVD VCD CD DATA CD



1 Press HDD or DVD.
- If you select DVD, press ⏏ OPEN/CLOSE and place a DVD or CD on the disc tray. Then press the button again to close the disc tray.
- If you insert a DVD VIDEO, VIDEO CD, CD, or DATA CD, press ▷. Playback starts.

With the playback side facing down

2 Press TITLE LIST.
For details about the Title List, see "Using the Title List" (page 37).
Example: DVD-RW (VR mode)


TITLE LIST
ORIGINAL
My Movies 1.5/4.7GB
Date
Title
Number
1 2ch 1:00PM - 2:00PM Wed 9/15
2 5ch 8:00PM - 9:00PM Fri 9/17
3 12ch 9:00AM - 9:30AM Sat 9/25
4 3ch 8:00PM - 8:30PM Sat 9/25
5 25ch 8:00PM - 8:30PM Fri 10/15
6 L2 9:00PM - 9:30PM Tue 10/19
7 8ch 9:00PM - 9:30PM Tue 10/26
8 ● 125ch 10:00AM - 10:30AM Thu 10/28

3 Select the title, and press ENTER.
The sub-menu appears.

4 Select "Play," and press ENTER.
Playback starts from the selected title on the disc.

To use the DVD's Menu

When you play a DVD VIDEO, or a finalized DVD+RW, DVD-RW (Video mode), DVD+R, or DVD-R, you can display the disc's menu by pressing TOP MENU or MENU.

To play VIDEO CDs with PBC functions

PBC (Playback Control) allows you to play VIDEO CDs interactively using the menu on your TV screen.
When you start playing a VIDEO CD with PBC functions, the menu appears.
Select an item using the number buttons and press ENTER. Then follow the instructions in the menu (press ▷ PLAY when "Press SELECT" appears). The PBC function of Super VCDs does not work with this recorder. Super VCDs are played in continuous play mode only.

To stop playback

Press ■ STOP.

To resume playback from the point where you stopped the disc (Resume Play)

When you press ▷ PLAY again after you stop the disc, the recorder resumes playback from the point where you pressed ■ STOP.
To start from the beginning, press TOOLS, select "Play Beginning" and press ENTER. Playback starts from the beginning of the title/track/scene.

The point where you stopped playing is cleared when:
– you open the disc tray (except for HDD).
– you play another title (except for HDD).
– you switch the Title List menu to Original or Playlist (DVD-RW in VR mode only).
– you edit the title after stopping playback.
– you change the settings on the recorder.
– you turn off the recorder (VIDEO CD/CD/DATA CD only).
– you make a recording (except for HDD/DVD-RWs in VR mode).

To play restricted DVDs (Parental Control)

If you play a restricted DVD, the message "Do you want temporarily change parental control to *?" appears on your TV screen.

1 Select "OK" and press ENTER.
The display for entering your password appears.
2 Enter your four digit password using the number buttons.
3 Press ENTER to select "OK."
The recorder starts playback.

To register or change the password, see "Parental Control (DVD VIDEO only)" (page 92).

To lock the disc tray (Child Lock)

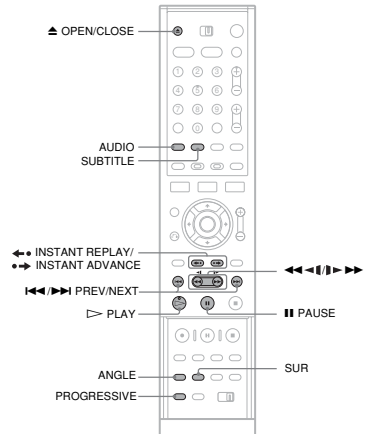
You can lock the disc tray to prevent children from ejecting the disc.
When the recorder is in standby mode, press ↶ RETURN, ENTER, and then I/⏻ on the remote.
"LOCKED" appears in the front panel display. The ⏏ OPEN/CLOSE button does not work while the Child Lock is set.

To unlock the disc tray, press ↶ RETURN, ENTER, and then I/⏻ on the remote again when the recorder is in standby mode.

Hints
- You can also use the ▷ PLAY button in step 3 (page 54) to start playback.
- Even if a timer recording starts during playback, neither the recording nor playback will stop. See page 60.
- Even if you select "Factory Setup" in Options Setup (page 94), the Child Lock remains set.

→continued

Playback options



Buttons	Operations	Discs
⏏ OPEN/CLOSE	Stops play and opens the disc tray.	All discs
AUDIO	Selects one of the audio tracks recorded on the disc when pressed repeatedly. DVD Selects the language. HDD -RWVR Selects the main or sub sound. VCD CD DATA CD Selects stereo or monaural audio tracks.	HDD -RWVR DVD VCD CD DATA CD
SUBTITLE	Selects a subtitle language when pressed repeatedly.	DVD
ANGLE	Selects an angle when pressed repeatedly. If various angles (multi-angles) for a scene are recorded on the disc, "" appears in the front panel display.	DVD

Buttons	Operations	Discs
SUR (surround)	Selects one of the TVS effects when pressed repeatedly. TVS* (TV Virtual Surround) lets you enjoy virtual surround sound effects created from the front left and right speakers. The selected setting is displayed in the front panel display for a few seconds. "TVS OFF": No surround effect "TVS DYNAMIC": Creates one set of virtual rear speakers. "TVS WIDE": Creates five sets of virtual rear speakers. "TVS NIGHT": Creates five sets of virtual rear speakers. Effective at low volume. "TVS STANDARD": Creates three sets of virtual rear speakers. Effective when you use two separate front speakers.	DVD * TVS was developed by Sony to produce home surround sound with just a stereo TV. This only works with multichannel Dolby Digital soundtracks.
PROGRESSIVE	Switches the type of video output signal to interlace or progressive format (page 18).	HDD +RW -RWVR -RWVideo +R -R DVD VCD
⏮ INSTANT REPLAY/ ⏭ INSTANT ADVANCE	Replays the scene/briefly fast forwards the scene.	HDD +RW -RWVR -RWVideo +R -R DVD
⏮ PREV/ ⏭ NEXT	Goes to the beginning of the previous/next title/ chapter/scene/track.	All discs
◀◀ ◀‖/‖▶ ▶▶ (fast reverse/fast forward)	Fast reverses/fast forwards the disc when pressed during playback. Search speed changes as follows: fast reverse: FR1 ← FR2 ← FR3* ← ← ← fast forward: → FF1 → → FF2 → → → FF3* When you press and hold the button, fast forward/fast reverse continues at the selected speed until you release the button.	All discs * FR3 and FF3 are only available for the HDD and DVDs.
◀◀ ◀‖/‖▶ ▶▶ (slow, freeze frame)	Plays in slow motion when pressed for more than one second in pause mode. Plays one frame at a time when pressed briefly in pause mode.	HDD +RW -RWVR -RWVideo +R -R DVD VCD * * Playback direction only
❚❚ PAUSE	Pauses playback.	All discs

To resume normal playback, press ▷ PLAY.

→continued

Notes

- To enjoy the TVS function, set "Digital Out" to "On" and "Dolby Digital" to "D-PCM" in Audio Setup.
- When the playback signal does not contain a signal for the rear speakers, the surround effects will be difficult to hear.
- When you select one of the surround modes, turn off the surround settings of the connected TV or amplifier (receiver).
- Make sure that your listening position is between and at an equal distance from your speakers, and that the speakers are located in similar surroundings.
- The TVS function cannot be used with discs recorded on this recorder. Angles and subtitles also cannot be changed.

Notes on playing DTS sound tracks on a CD

- When playing DTS-encoded CDs, excessive noise will be heard from the analog stereo jacks. To avoid possible damage to the audio system, the consumer should take proper precautions when the analog stereo jacks of the recorder are connected to an amplification system. To enjoy DTS Digital Surround™ playback, an external 5.1-channel decoder system must be connected to the digital jack of the recorder.
- Set the sound to "Stereo" using the AUDIO button when you play DTS sound tracks on a CD (page 56).

Notes on playing DVDs with a DTS sound track

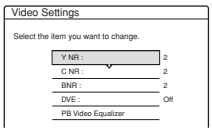
DTS audio signals are output only through the DIGITAL OUT (COAXIAL or OPTICAL) jack.
When you play a DVD with DTS sound tracks, set "DTS" to "On" in Audio Setup (page 90).

Adjusting the picture quality

HDD +RW -RWVR -RWVideo +R -R DVD VCD

1 Press TOOLS during playback.
The TOOLS menu appears.

2 Select "Video Settings," and press ENTER.



3 Select an item, and press ENTER.
The adjustment display appears.
"Y NR" (luminance noise reduction): Reduces noise contained in the luminance element of the video signal.
"C NR" (chroma noise reduction): Reduces noise contained in the color element of the video signal.
"BNR" (block noise reduction): Reduces "block noise" or mosaic like patterns in the picture.
"DVE" (digital video enhancer): Sharpens the outlines of the images.
"PB Video Equalizer" (Playback video equalizer): Adjusts the picture in greater detail.
Select an item and press ENTER.
- Contrast: changes the contrast.
- Brightness: changes the overall brightness.
- Color: makes the colors deeper or lighter.
- Hue: changes the color balance.

4 Press ←/→ to adjust the setting, and press ENTER.
The default settings are underlined.
"Y NR": (weak) Off 1 2 3 (strong)
"C NR": (weak) Off 1 2 3 (strong)
"BNR": (weak) Off 1 2 3 (strong)
"DVE"*: (weak) Off 1 2 3 (strong)
"PB Video Equalizer":
- Contrast: (weak) –3 ~ 0 ~ 3 (strong)
- Brightness: (dark) –3 ~ 0 ~ 3 (bright)
- Color: (light) –3 ~ 0 ~ 3 (deep)
- Hue: (red) –3 ~ 0 ~ 3 (green)

Repeat steps 3 and 4 to adjust any other items.
* "1" softens the outlines of the images. "2" enhances the outlines and "3" enhances them more than "2."

Notes

- If the outlines of the images on your screen become blurred, set "BNR" to "Off."
- Depending on the disc or the scene being played, the above BNR, Y NR, or C NR effects may be hard to discern. And, these functions may not work with some screen sizes.
- When playing a disc recorded in SLP recording mode, the BNR setting may have little effect.
- When using the DVE function, noise found in the disc may become more apparent. In this case, it is recommended that you use the BNR function with the DVE function. If the condition still does not improve, set the DVE level to "1" or "Off."

Adjusting the sound quality

HDD +RW -RWVR -RWVideo +R -R DVD VCD CD

1 Press TOOLS during playback.
The TOOLS menu appears.

2 Select "Audio Settings," and press ENTER.

3 Select an item, and press ENTER.
"Surround (TVS)" (DVD VIDEO only): Selects one of the surround modes. For more information, see "Playback options" (page 56).

"Audio Filter" (all discs): Selects the digital filter to reduce noise above 22.05 kHz (Fs* is 44.1 kHz, 24 kHz (Fs is 48 kHz), or 48 kHz (Fs is above 96 kHz).
- Sharp (default): Provides a wide frequency range and spatial feeling.
- Slow: Provides smooth and warm sound.

* Sampling frequency of audio source. This function only adjusts the output signals from the LINE OUT (AUDIO L/R) 1/2 jacks.

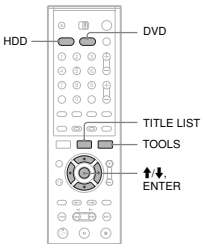
4 Press ←/↑/↓/→ to select the option, and press ENTER.

Note

There may be little effect by changing the Audio Filter depending on the disc or playback environment.

Chasing Playback/ Simultaneous Rec and Play

You can view the beginning of a program while it is being recorded. You can also play a title or previously recorded program while recording.



Playing from the beginning of the program you are recording (Chasing Playback)

HDD -RWVR

"Chasing Playback" allows you to view the recorded part of a program while the recording is being made. You do not need to wait until the recording finishes.

1 **Press TOOLS while recording.**
The TOOLS menu appears.

2 **Select "Chasing Playback," and press ENTER.**
Playback starts from the beginning of the program you are recording.
When you fast forward to the point that you are recording, Chasing Playback returns to normal playback.

Notes

- For DVD-RWs (VR mode), this function does not work when recording:
  – on a 1x-speed DVD-RW.
  – in the HQ or HSP recording mode.
- The DVD's picture on your TV screen freezes for a few seconds when you fast forward/fast reverse or instant replay/advance the recording.

Playing a previous recording while making another (Simultaneous Rec and Play)

HDD +RW -RWVR -RWVideo +R -R DVD VCD CD DATA CD

"Simultaneous Rec and Play" allows you to view a previously recorded program while recording programs. Playback continues even if a timer recording starts. Use this function as follows:

- While recording to the HDD:
  Play another title on the HDD.
  Play a previously recorded program on a DVD by pressing DVD.
- While recording to a DVD:
  Play a previously recorded program on the HDD by pressing HDD.
- While recording to a DVD-RW (VR mode)*1:
  Play another title on the same DVD-RW (VR mode) disc.*2

*1 Simultaneous Rec and Play function does not work when you record:
– on a 1x-speed DVD-RW.
– in the HQ or HSP recording mode.

*2 Picture noise may appear depending upon the condition of the recording, or when playing a title recorded in the HQ or HSP recording mode.

You can also play a DVD VIDEO, VIDEO CD, Super VCD, CD, or DATA CD while recording on the HDD.

Example: Play another title on the HDD while recording to the HDD.

1 While recording, press TITLE LIST to display the HDD Title List.

2 Select the title you want to play, and press ENTER.

3 Select "Play" from the sub-menu, and press ENTER.
Playback starts from the selected title.

Example: Play a DVD while recording to the HDD.

1 While recording, press DVD and insert the DVD into the recorder.

2 Press TITLE LIST to display the DVD Title List.

3 Select the title you want to play, and press ENTER.

4 Select "Play" from the sub-menu, and press ENTER.
Playback starts from the selected title.

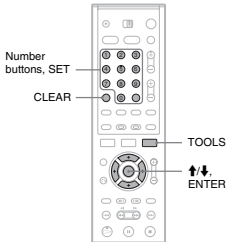
Note

The DVD's playback picture on your TV screen freezes for a few seconds when you fast forward/fast reverse or instant replay/advance during Simultaneous Rec and Play.

Searching for a Title/ Chapter/Track, etc.

HDD +RW -RWVR -RWVideo +R -R DVD VCD CD DATA CD

You can search a disc by title, chapter, scene or track. As titles and tracks are assigned individual numbers on the disc, select the title or track by entering its number. You can also search for a scene using the time code.



1 **Press TOOLS during playback.**
The TOOLS menu appears.

2 **Select a search method, and press ENTER.**
"Title Search" (for DVDs)
"Chapter Search" (for HDD/DVDs)
"Track Search" (for CDs/DATA CDs)
"Search" (for VIDEO CDs)
"Album Search" (for DATA CDs)
"Time Search" (for HDD/DVDs): Searches for a starting point by entering the time code.

The display for entering the number appears.
Example: Title Search

The number in parentheses indicates the total number of titles, tracks, etc.

→continued

3 **Press the number buttons to select the number of the title, chapter, track, time code, etc., you want.**
For example: Time Search
To find a scene at 2 hours, 10 minutes, and 20 seconds, enter "21020."
If you make a mistake, press CLEAR to cancel the number, then select another number.

4 **Press SET.**
The recorder starts playback from the selected number.

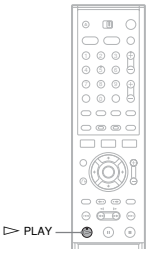
Note

"Title Search" is not applicable to the HDD.

Playing MP3 Audio Tracks

DATA CD

You can play MP3 audio tracks on DATA CDs (CD-ROMs/CD-Rs/CD-RWs).



1 **Insert a DATA CD on the disc tray.**

2 **Press ▷ PLAY.**
Playback starts from the first MP3 audio track on the disc. Note that the playback order may be different from the edited order. See "Playback order of MP3 audio tracks."

About MP3 audio tracks

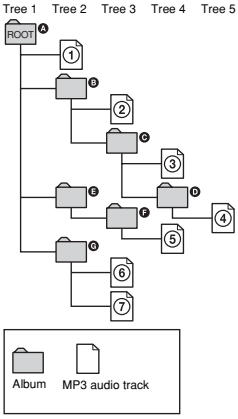
MP3 is audio compression technology that satisfies certain ISO/MPEG regulations.
You can play back DATA CDs (CD-ROMs/CD-Rs/CD-RWs) recorded in MP3 (MPEG1 Audio Layer 3) format. However, the discs must be recorded according to ISO9660 Level 1, Level 2 or Joliet format for the recorder to recognize the tracks. You can also play discs recorded in Multi Session.
See the instructions supplied with the CD-R/CD-RW drives and the recording software (not supplied) for details on the recording format.

Note on Multi Session discs

If MP3 audio tracks are recorded in the first session, the recorder will also play MP3 audio tracks in other sessions. If audio tracks in Music CD format are recorded in the first session, only the first session will be played back.

Playback order of MP3 audio tracks

Albums containing MP3 audio tracks play in the following order.
Ⓐ → Ⓑ → Ⓒ → Ⓓ → Ⓕ → Ⓖ. Albums that do not contain tracks (such as album Ⓔ) are skipped.



When you insert a DATA CD and press ▷ PLAY, the numbered tracks are played sequentially, from ① through ⑦. Any sub-albums/tracks contained within a currently selected album take priority over the next album in the same tree. (Example: Ⓒ contains Ⓓ so ④ is played before ⑤.)

Hints

- You can view the disc information while playing MP3 audio tracks (page 42).
- If you add numbers (01, 02, 03, etc.) to the front of the track names when you store the tracks in a disc, the tracks will be played in that order.
- Since a disc with many trees takes longer to start playback, it is recommended that you create albums with no more than two trees.

Notes

- Depending on the software you use to create the DATA CD, the playback order may differ from the above illustration.
- Proceeding to the next or another album may take some time.
- The recorder may not be able to play some DATA CDs created in the Packet Write format.
- The recorder will play any data with the extension ".MP3," even if they are not in MP3 format. Playing this data may generate a loud noise which could damage your speaker system.
- The recorder does not conform to audio tracks in MP3PRO format.
- The playback order above may not be applicable if there are more than a total of 999 albums and tracks in the DATA CD.
- The recorder can recognize up to 499 albums (the recorder will count just albums, including albums that do not contain MP3 audio tracks). The recorder will not play any albums beyond the first 499 albums. Of the first 499 albums, the recorder will play no more than a combined total of 999 albums and tracks.
- The recorder can play MP3 audio tracks recorded in the following sampling frequencies: 32 kHz, 44.1 kHz, 48 kHz.
- ID3 tags cannot be displayed.
- Only alphabet and numbers can be used for album or track names. Anything else is displayed as an asterisk.

Before Editing

This recorder offers various edit options for various disc types. Before you edit, check the disc type in the front panel display, and select the option available for your disc (page 8).

Note

You may lose the edited contents if you remove the disc or a timer recording starts while editing.

Edit options for the HDD and DVD+RWs/DVD-RWs (Video mode)/ DVD+Rs/DVD-Rs

HDD +RW -RW Video +R -R

You can perform simple edits. Since Video mode titles are actual recordings on the disc, you cannot undo any edits you make. The edit functions available for Video mode titles are:
– Setting protection against erasure (page 65).
– Labeling a title (page 65).
– Erasing a title (page 65).
– Erasing multiple titles (page 66).
– Erasing a section of a title (A-B Erase) (HDD and DVD+RWs only) (page 66).
– Erasing titles to open up disc space (Disc Map) (DVD-RWs in Video mode and DVD+RWs only) (page 67).

Notes

- Once the DVD is finalized, you cannot edit or record on the disc (except for DVD+RWs and DVD-RWs (VR mode)).
- You cannot create a Playlist (see below).
- If a message appears and indicates that the disc's control information is full, erase unnecessary titles.

Edit options for DVD-RWs (VR mode)

-RW VR

You can enjoy advanced edit functions. First you have two options for a DVD-RW (VR mode): editing either the original recording (called the "original"), or the playback information created from the original (called a "Playlist"). Since each is different in nature and offers different merits, read the following and select the one that better suits your needs.

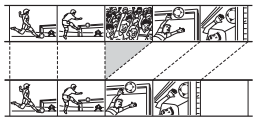
To edit original titles

Edits made to the original titles are final. If you plan to retain an unaltered original recording, create and edit a Playlist (see below). The edit functions available for original titles are:
– Labeling a title (page 65).
– Setting protection against erasure (page 65).
– Erasing a title (page 65).
– Erasing multiple titles (page 66).
– Erasing a section of a title (A-B Erase) (page 66).

To create and edit Playlist titles

A Playlist is a group of Playlist titles created from the original title for editing purposes. When you create a Playlist, only the control information necessary for playback, such as the playback order, is stored on the disc. Since the original titles are left unaltered, Playlist titles can be re-edited.

Example: You have recorded the final few matches of a soccer tournament on a DVD-RW (VR mode). You want to create a digest with the goal scenes and other highlights, but you also want to keep the original recording.



In this case, you can compile highlight scenes as a Playlist title. You can even rearrange the scene order within the Playlist title ("Creating and Editing a Playlist" on page 68).

The advanced edit functions available for Playlist titles are:
– Labeling a title (page 65).
– Erasing a title (page 65).
– Erasing multiple titles (page 66).
– Erasing a section of a title (A-B Erase) (page 66).
– Rearranging the title order (page 70).
– Dividing a title into multiple titles (page 70).
– Combining multiple titles into one title (page 71).

Hint

You can display the disc's Playlist titles in the Title List (Playlist), or the original titles in the Title List (Original). To switch the two Title Lists, press TOOLS while a Title List is displayed, and select "Original" or "Playlist."

Notes

- The Playlist title calls up data from the original titles for playback. When an original title is used for a Playlist title, the original title cannot be erased.
- You cannot protect Playlist titles.
- If a message appears and indicates that the disc's control information is full, erase unnecessary titles.

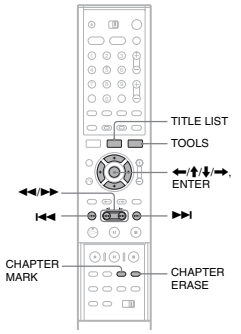
Editing a Title

HDD +RW -RW VR -RW Video +R -R

This section explains the basic edit functions. Note that editing is irreversible. To edit a DVD-RW (VR mode) without changing the original recordings, create a Playlist title (page 68).

Note

When editing a DVD+R, DVD-R, or DVD-RW (Video mode), finish all editing before finalizing the disc. You cannot edit a finalized disc.



1 Press TITLE LIST.
When editing a DVD-RW in VR mode, press TOOLS and select "Original" or "Playlist" from the TOOLS menu to switch the Title Lists, if necessary.

2 Select a title, and press ENTER.
The sub-menu appears.

3 Select an option, and press ENTER.
You can make the following edits to the title.
"Erase": Erases the selected title. Select "OK" when asked for confirmation. When the title is protected, the display asks for confirmation. To erase, select "Change," and when the Protection display appears, select "Off."

→continued

"Protect Title": Protects the title. Select "On" when the Protection display appears. "🔒" appears next to the protected title. To cancel the protection, select "Off."
"Title Name": Allows you to enter or re-enter a title name (page 43).
"Set Thumbnail": Changes the title's thumbnail picture that appears in the Title List (page 38).
"A-B Erase": Erases a section of the title (see below).

Hints

- You can erase multiple titles at one time (page 66), or erase all of the titles on the disc at once (page 40).
- You can label or re-label DVDs (page 40).

Note

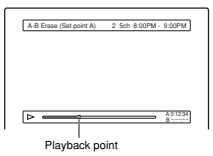
You cannot protect Playlist titles.

Erasing a section of a title (A-B Erase)

HDD +RW -RW VR

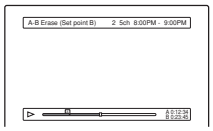
You can select a section (scene) in a title and erase it. Note that erasing scenes in a title cannot be undone.

1 After step 2 of "Editing a Title," select "A-B Erase" and press ENTER.
The display for setting point A appears.



- When the title is protected, the display asks for confirmation. To continue, select "Change," and when the protection display appears, select "Off."

2 Select point A by pressing ◀◀/▶▶, and press ENTER.
The display for setting point B appears.



3 Select point B by pressing ◀◀/▶▶, and press ENTER.
The display asks for confirmation. To reset either point A or B, select "Change A" or "Change B," and go to step 2 or 3.

4 Select "OK," and press ENTER.
The scene is erased, and the display asks whether to erase another scene. To continue, select "Yes," and repeat from step 2. To finish, select "No."

Hint

A chapter mark is inserted after the scene was erased. The chapter mark divides the title into separate chapters on either side of the mark.

Notes

- Images or sound may be momentarily interrupted at the point where you erase a section of a title.
- Sections shorter than five seconds may not be erased.
- For DVD+RWs, the erased section may be slightly different from the points you selected.

Erasing multiple titles (Erase Titles)

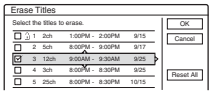
HDD +RW -RW VR -RW Video +R -R

You can select and erase two or more titles at one time using the TOOLS menu.

1 Press TITLE LIST to turn on the Title List menu, and press TOOLS.
The TOOLS menu appears.

2 Select "Erase Titles," and press ENTER.
The display for selecting titles to be erased appears.

3 Select a title, and press ENTER.
A check mark appears in the check box next to the selected title. To clear the check mark, press ENTER again. To clear all of check marks, select "Reset All."



- When the title is protected, the display asks for confirmation. To continue, select "Change," and when the protection display appears, select "Off." To cancel, select "Close."

4 Repeat step 3 to select all of the titles you want to erase.

5 When you finish selecting titles, select "OK," and press ENTER.
The list of the titles to be erased appears for confirmation. To change the selection, select "Change," and repeat from step 3.

6 Select "OK," and press ENTER.
The titles are erased.

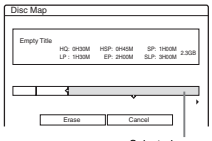
Erasing titles to open up disc space (Disc Map)

+RW -RW Video

When recording on a DVD+RW or DVD-RW (Video mode), the recorder searches for the largest open space and records there. Before you start, check the disc status by using Disc Map, and erase titles to create a space large enough for the recording.

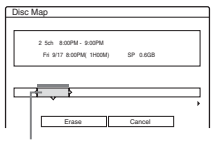
1 Insert a disc and press TITLE LIST.

2 Press TOOLS and select "Disc Map," and press ENTER.
The Disc Map appears. To check the open space, select the space by pressing ←/→.



- When ◀ or ▶ appears on either side of the screen, you can scroll sideways by pressing ←/→.

3 Select a title by pressing ←/→, and press ENTER.
The display for selecting titles to be erased appears. To cancel the selection, press ENTER again.



- When the title is protected, the display asks for confirmation. To continue, select "Change," and when the protection display appears, select "Off." To cancel, select "Close."

4 Repeat step 3 when erasing more titles.

5 Select "Erase," and press ENTER.
The display asks for confirmation. To change the selection, select "Change."

6 Select "OK," and press ENTER.
The selected titles are erased, freeing up disc space.

→continued

Creating chapters manually

HDD -RWVR

You can manually insert a chapter mark at any point you like during playback or recording.

Press CHAPTER MARK at the point where you want to divide the title into chapters.
Each time you press the button, “Marking...” appears on the screen and the scenes to the left and right of the mark become separate chapters.

To erase chapter marks

You can combine two chapters by erasing the chapter mark during playback.
Press I◄◄ /►►I to search for a chapter number, and while displaying the chapter containing the chapter mark you want to erase, press CHAPTER ERASE.
The current chapter combines with the previous chapter.

Notes

- If a message appears and indicates that no more chapter marks can be added, you may not be able to record or edit.
- When dubbing, any chapter marks you enter will be erased.

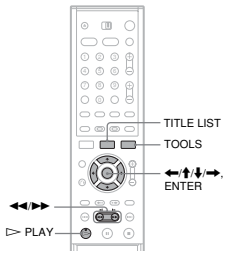
Creating and Editing a Playlist

-RWVR

Playlist edit allows you to edit or re-edit without changing the actual recordings. A Playlist title can contain up to 50 scenes.
For details, see “Edit options for DVD-RWs (VR mode)” (page 64).

Note

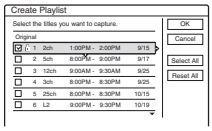
Once you create a Playlist title from original titles, you will be unable to erase or edit the original titles.



1 Press TITLE LIST to turn on the Title List menu, and press TOOLS.
The TOOLS menu appears.

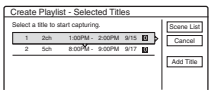
2 Select “Create Playlist,” and press ENTER.
The display for selecting titles appears.

3 Select the title you want to include in the Playlist title, and press ENTER.
A check mark appears in the check box next to the selected title. To clear the check mark, press ENTER again. To select all of the titles, select “Select All.”



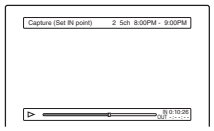
4 Repeat step 3 to add more titles.
To go to the next page of titles, press ↓. To clear all of the check marks, select “Reset All.”

5 Select “OK,” and press ENTER.
The list of selected titles appears. To add another title, select “Add Title.”

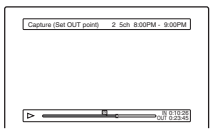


6 Select one of the titles, and press ENTER.
The sub-menu appears.
“Capture”: Adds a section of the title to the Playlist title as one scene.
“Capture All”: Adds the entire title to the Playlist title as one scene. After capturing the title, select “Scene List” and go to step 12.
“Check Scenes”: Allows you to check the captured scene.

7 Select “Capture,” and press ENTER.
The display for setting the start point (IN) appears. The title starts to play in the background.



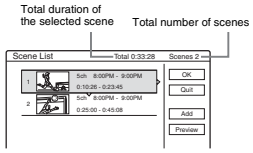
8 Select the IN point by pressing ◄◄/►►, and press ENTER.
The display for setting the end point (OUT) appears, and the title continues to play in the background.



9 Select the OUT point by pressing ◄◄/►►, and press ENTER.
The display asks for confirmation. To reset the IN or OUT point, select “Change IN” or “Change OUT” and repeat step 8 or 9. To view the selected scene, select “Preview.”

10 Select “OK,” and ENTER.
The selected section is captured as a scene, and the display asks whether you want to continue. To continue, select “More,” and repeat the steps above. To capture a scene from another title, select “New Title.”

11 When you finish capturing scenes, select “No more” and press ENTER.
The Scene List menu appears with all of the selected scenes.



12 Select the scene you want to edit, and press ENTER.
The sub-menu appears.
“Move”: Changes the scene order.
“Erase”: Erases the scene. The selection is canceled.
“Preview”: Displays thumbnail pictures of the scenes.
“Change IN”: Allows you to change the IN point, and repeat from step 8.

➞continued

“Change OUT”: Allows you to change the OUT point, and repeat from step 9.

To add more scenes, select “Add” and go to step 6. To preview all of the captured scenes in the listed order, select “Preview.”

13 When you finish editing the Scene List, select “OK,” and press ENTER.
The display for entering the title name appears. To enter a new name, select “Enter” (see page 43).

14 Select “OK” to use the default name, and press ENTER.

To play the Playlist title

Press TOOLS while the Title List menu is turned on. Then, select “Playlist” and press ENTER.
When the Title List (Playlist) menu appears, select a title and press ▻ PLAY.

Hint

When a Playlist title is created, the IN and OUT points will become chapter marks, and each scene will become a chapter.

Note

The picture may pause when the edited scene is played.

Moving a Playlist title (Move Title)

-RWVR

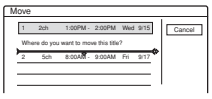
You can change the Playlist title order within the Title List (Playlist).

1 Press TITLE LIST to turn on the Title List (Playlist) menu.
If the Title List (Original) menu appears, press TOOLS and select “Playlist.”

2 Select “Number” in the “Sort” column, and press ENTER.
The titles are sorted in order of title number.

3 Select a title, and press ENTER.
The sub-menu appears.

4 Select “Move Title,” and press ENTER.



5 Select a new location for the title by pressing ↑/↓ and press ENTER.
The title moves to the new location.

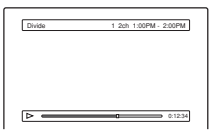
Dividing a Playlist title (Divide Title)

-RWVR

1 Press TITLE LIST to turn on the Title List (Playlist) menu.
If the Title List (Original) menu appears, press TOOLS and select “Playlist.”

2 Select a title, and press ENTER.
The sub-menu appears.

3 Select “Divide Title,” and press ENTER.
The display for setting the dividing point appears. The title starts to play in the background.



4 Select the dividing point by pressing ◄◄/►►, and press ENTER.
The display asks for confirmation. To change the dividing point, select “Change.”

5 Select “OK,” and press ENTER.
The display for entering the title name appears. To use the same title name as before, select “No.”

6 Select “Yes,” and press ENTER to enter a new name.
Follow the explanations on page 43. After you enter a new name, the title is divided in two.

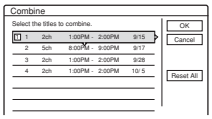
Combining multiple Playlist titles (Combine Titles)

-RWVR

1 Press TITLE LIST to turn on the Title List (Playlist) menu.
If the Title List (Original) menu appears, press TOOLS and select “Playlist.”

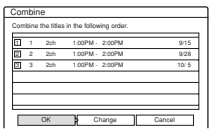
2 Press TOOLS to select “Combine Titles,” and press ENTER.
The display for selecting titles appears.

3 Select a title, and press ENTER.
A number indicating the order in which you selected the title appears. To cancel the selection, press ENTER again.



4 Repeat step 3 to select all of the titles you want to combine.
To cancel all of the selections, select “Reset All.”

5 Select “OK,” and press ENTER.
The list of titles to be combined appears. To change the selection, select “Change” and go to step 3.



6 Select “OK,” and press ENTER.
The display for selecting a title name from among the selected titles appears. To enter a new name, select “Enter Text,” and follow the explanations on page 43.

7 Select a name, and press ENTER.
The titles are combined.

Before Dubbing

HDD +RW -RWVR -RWVideo +R -R

In this section, “dubbing” refers to “copying a recorded title on the internal hard disk drive (HDD) to another disc, or vice versa.” You can select to dub one title at a time (Title Dubbing – see “Dubbing a Single Title (Title Dub)” on page 74), or multiple titles all at once (Multiple Title Dubbing – see “Dubbing Multiple Titles (Dub Selected Titles)” on page 75).
Before you start, read the following precautions, which are common to both dubbing methods.

Hint
This section deals with dubbing to and from the internal HDD. If you want to record from a digital video camera connected to the DV IN jack, see “DV/Digital8 Dubbing (DV → HDD/DVD)” on page 77. To record from equipment connected to the LINE IN jacks, see “Recording From a VCR or Similar Device” (page 53).

Before you start…

- Select the disc type according to your needs (page 8). This recorder can record on various discs.
- Timer recordings do not start during dubbing. Before you start, check the SCHEDULE list (page 49) to see if there is a timer recording due to start during dubbing.
- Chapter marks in the original recording do not remain in the dubbed title. Chapter marks are entered according to the “Auto Chapter” setting in Features Setup (page 91).
- For a title whose aspect ratio (16:9 or 4:3) is mixed:
  – When dubbed from the HDD to DVD-RW (Video mode) or DVD-R, the picture size is determined by the setting in “DVD Rec. Picture Size” (page 51).
  – When dubbed from HDD to DVD+RW or DVD+R, the picture size is always 4:3.
  – When dubbed from HDD to DVD-RW (VR mode), the originally recorded picture size is retained.

Hints
- You can dub a Playlist title on a DVD-RW (VR mode) as an original title on the HDD.
- When dubbed from a DVD to the HDD, the picture size and the sound types originally recorded are retained.

Notes
- The recorder may not function as described depending on the disc status. Follow the instructions that appear on the screen.
- When a message appears and indicates that the control information is full, erase unnecessary titles (page 65).
- You cannot dub from DVD VIDEOs or a DVD recorded on other DVD equipment to the HDD.
- Thumbnails that you have set for the originally recorded title (page 38) will not be retained in the dubbed title.

About “Dub Mode”

With this recorder, the recording mode for dubbing is displayed as “Dub Mode.” Two dubbing methods are available: High-speed Dubbing and Rec Mode Conversion Dubbing. Read the following and select according to the required time, disc space, and picture quality.

Dubbing at high-speed (High-speed Dubbing)

HDD ➡ +RW / -RWVR / -RWVideo / +R / -R

Allows you to dub what you have stored in the HDD to a high-speed DVD (4x-speed DVD+RWs/2x-speed DVD-RWs/8x-speed DVD+Rs/8x-speed DVD-Rs, or slower versions of each disc type), without changing the recording mode. Dubbing speed is increased when the recording mode of the original title is of a longer recording mode (such as SLP).
Select “Fast” when selecting the “Dub Mode” in “Dubbing a Single Title (Title Dub)” (page 74) or “Dubbing Multiple Titles (Dub Selected Titles)” (page 75). The minimum required time is as follows (approximate).
Example: When a 120 minute-title is dubbed to a high-speed DVD-R in LP mode, dubbing becomes 12 times faster, and takes a minimum of 10 minutes. (120 minutes ÷ 12 = 10 minutes).

Note that speeds shown in the table are an approximate of the maximum dubbing speed.

Speed*1	x2.4-speed	x2-speed	x4-speed
Rec mode	High-speed DVD+RW	High-speed DVD-RW	High-speed DVD+R/ DVD-R
HQ	x2.4	x2	x4
HSP	x3.6	x3	x6
SP	x4.8	x4	x8
LP	x7.2	x6	x12
EP	x9.6	x8	x16
SLP	x1	x12	x24*2

*1 Maximum recording speed of this recorder.
*2 When dubbing to DVD+Rs, the dubbing speed is x1-speed.

Notes
- High-speed Dubbing is not available for the following titles:
  – Titles recorded in HQ+.
  – Titles that contain both stereo or monaural audio tracks (except DVD-RWs (VR mode)).
  – Titles recorded in mixed picture size (4:3 and 16:9 etc.) (except DVD-RWs (VR mode)).
  – Titles recorded in SLP (DVD+RW/DVD+R only).
- When dubbed to a DVD-RW (Video mode)/ DVD+RW/DVD+R/DVD-R, erased pictures may remain on the disc.

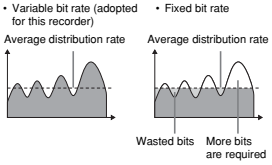
Rec Mode Conversion Dubbing

HDD ↔ +RW / -RWVR / -RWVideo / +R / -R

Allows you to dub from the HDD to a DVD or vice versa, in a dubbing mode that differs from the original recordings. For example, when you dub an HQ title (data size is large) in SP mode, you can reduce the data size, saving more titles using less space.
Select a mode different from the original recording in “Dub Mode” in the steps of “Dubbing a Single Title (Title Dub)” (page 74) or “Dubbing Multiple Titles (Dub Selected Titles)” (page 75).
When an HQ or HQ+ title is converted to another mode, the recorder automatically assigns an appropriate bit rate, thus retaining the original picture quality as much as possible (“Dynamic VBR Dubbing”).

◆About “VBR”

VBR (Variable Bit Rate) is an effective method of allocating a suitable bit amount per second. Fine detail pictures or dynamically moving pictures are assigned a larger amount, while static pictures are assigned less, for optimum picture quality.


• Variable bit rate (adopted for this recorder)
• Fixed bit rate
Average distribution rate
Average distribution rate
Wasted bits
More bits are required

Hint
When you dub an edited title using the Rec Mode Conversion Dubbing method, pauses between scenes are smoothed out.

Note
The picture quality will not improve even if a title is converted to a recording mode of better picture quality.

Dubbing restriction

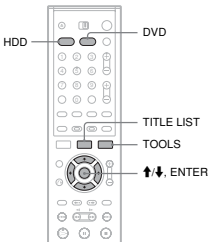
Some DVD VIDEOs or TV programs contain copy protection signals such as “Copy-Never” or “Copy-Once.” You cannot record such contents on this recorder (only a gray, blank screen will be recorded). Be especially careful when dubbing on a non-rewritable DVD such as a DVD-R.

Copy protection signals	Original recording	Dubbing ➡
Copy-Free	HDD	+RW -RWVR -RWVideo +R -R
	+RW -RWVR -RWVideo +R -R	HDD
Copy-Once	HDD -RWVR *	recorded in gray.
Copy-Never	recorded in gray.	

* Version 1.1 CPRM-compatible DVD-RW (VR mode) only (page 8).

Dubbing a Single Title (Title Dub)

HDD +RW -RWVR -RWVideo +R -R



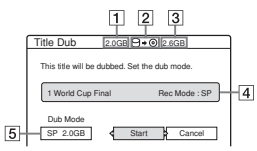
1 Insert the DVD that you are going to dub to or from.

2 Select the source by pressing HDD or DVD.

3 Press TITLE LIST to turn on the Title List menu.

4 Select a title and press ENTER.
The sub-menu appears.

5 Select “Dubbing” and press ENTER.
The display for selecting the dubbing mode appears.



1 Size of the title (approximate).
2 Direction of dubbing.
3 Available space on the disc to be dubbed (approximate).
4 Information about the title to be dubbed.
5 Dubbing mode and the space that remains after dubbing (approximate).

6 Select “Dub Mode.”

7 Select a dubbing mode by pressing ↑/↓.

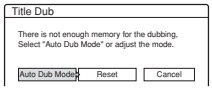
→Fast* → HQ → HSP → SP →
SLP ← EP ← LP ←

* Appears when High-speed Dubbing is available for the title (page 72).

8 Select “Start,” and press ENTER.

To automatically adjust the dubbing mode (Auto Dub Mode)

The recorder adjusts the dubbing mode in order to fit a title on the disc. If there is insufficient disc space in the selected dubbing mode, the following display appears after step 8.



Select “Auto Dub Mode” and press ENTER to start dubbing. To manually select another dubbing mode, select “Reset,” and go to step 7.

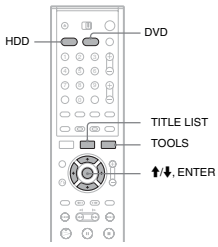
To stop dubbing

Press TOOLS to turn on the TOOLS menu. Or, while the Title List menu is displayed, press ENTER to display the sub-menu. Select “Stop Dubbing,” and press ENTER. When asked for confirmation, select “Yes,” and press ENTER.

Hints
- If disc space is still insufficient for the selected dubbing mode, erase unnecessary parts of the title, or free up disc space by erasing titles on the disc (page 65).
- You can turn off the recorder without affecting the dubbing. Press I/⏻ during dubbing.
- You can start Title Dubbing by selecting “DUBBING” from the System Menu.

Dubbing Multiple Titles (Dub Selected Titles)

HDD +RW -RWVR -RWVideo +R -R



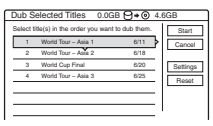
1 Insert the DVD that you are going to dub to or from.

2 Select the source by pressing HDD or DVD.

3 Press TITLE LIST to turn on the Title List menu.

4 Press TOOLS.
The TOOLS menu appears.

5 Select “Dub Selected Titles,” and press ENTER.
The display for selecting titles appears.



6 Select titles in the order you want to dub, and press ENTER.
The titles are numbered in the selected order. To cancel the selection, press ENTER again.

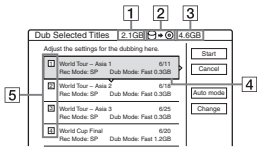
7 Repeat step 6 to select all of the titles you want to dub.
To make adjustments for each of the titles, select “Settings” (see “Adjusting the settings for each title” below). To cancel all of the selections, select “Reset,” and go to step 6.

8 Select “Start,” and press ENTER.

Adjusting the settings for each title

You can make detailed settings for each of the selected titles during Multiple Title Dubbing.

1 In step 7 of “Dubbing Multiple Titles (Dub Selected Titles)” (page 75), select “Settings” and press ENTER.
The following display for making the adjustments appears. To re-select titles, select “Change,” and go to step 6 of “Dubbing Multiple Titles (Dub Selected Titles)” above. To have the recorder adjust the dubbing mode so all of the selected titles fit in, select “Auto mode.”



1 Total size of the selected titles.
2 Direction of dubbing.
3 Available space on the disc to be dubbed (approximate).
4 Information about the title to be dubbed (title name, original recording mode, dubbing mode, and data size after dubbing).
5 Order of dubbing.

➡continued

2 Select the title which you want to adjust, and press ENTER.

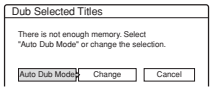
The sub-menu appears.
"Dub Mode": Selects the dubbing mode for each title (see page 72).
"Change Order": Moves the title to change the dubbing order. Press ↑/↓ to select a new location, and press ENTER.
"Cancel": Cancels the title selection. The title is excluded from dubbing.

3 Select an option, and press ENTER.

4 When you finish making adjustments, select "Start," and press ENTER.

To automatically adjust the dubbing mode (Auto Dub Mode)

The recorder adjusts the dubbing mode so all of the titles fit in. The same dubbing mode is set for all of the titles. If disc space is insufficient for the selected dubbing mode, the following display appears after step 8 of "Dubbing Multiple Titles (Dub Selected Titles)" (page 75).



Select "Auto Dub Mode" and press ENTER. If you have selected only one title, select "OK."

To stop dubbing

Press TOOLS to turn on the TOOLS menu. Select "Stop Dubbing" and press ENTER. When asked for confirmation, select "Yes," and press ENTER.

Hints

- You can turn off the recorder without affecting the dubbing. Press I/⏻ during dubbing.
- You can start Multiple Title Dubbing by selecting "DUBBING" from the System Menu.

DV/Digital8 Dubbing (DV → HDD/DVD)

Before DV/Digital8 Dubbing

This section explains dubbing with a digital video camera via the DV IN jack on the front panel. If you want to dub by way of the LINE IN jacks, see "Recording From a VCR or Similar Device" on page 53.

To record from the DV IN jack

The DV IN jack on this recorder conforms to the i.LINK standard. You can connect any other equipment that has an i.LINK (DV) jack, and record digital signals.
Follow the instructions in "Preparing for recording using the DV IN jack," and then move on to the section on dubbing. For more information about i.LINK, see "About i.LINK" (page 103).

Hint

If you plan to do additional editing on a disc after the initial dub, use the DV IN jack and record on a DVD-RW (VR mode) or HDD.

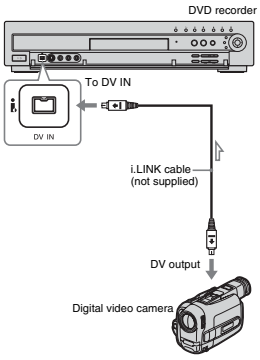
Preparing for recording using the DV IN jack

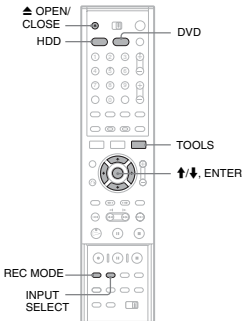
You can connect a digital video camera to the DV IN jack on the recorder to record or edit from a DV/Digital8 format tape. Operation is straightforward because the recorder will fast forward and rewind the tape for you – you do not need to operate your digital video camera. Do the following to start using the "DV Edit" functions of this recorder.
See the instruction manual supplied with the digital video camera as well before connecting.

Notes

- The DV IN jack is for input only. It will not output signals.
- You cannot use the DV IN jack when:
  – your digital video camera does not work with this recorder. Connect the camera to the LINE IN jack and follow the instructions of "Recording From a VCR or Similar Device" (page 53).
  – the input signal is not in DVC-SD format. Do not connect a MICRO MV format digital video camera even if it has an i.LINK jack.
  – the images on the tape contain copy protection signals, which limit recording.
- If you want to play the disc on other DVD equipment, finalize the disc (page 40).

Hookups





→continued

1 Press HDD or DVD.

If you select DVD, press ⏏ OPEN/CLOSE and place a DVD on the disc tray. Press ⏏ again to close the disc tray.

With the recording side facing down

Wait until "LOAD" disappears from the front panel display.
If you use an unused DVD, formatting starts automatically.

2 Insert the source DV/Digital8 format tape into your digital video camera.

For the recorder to record or edit, your digital video camera must be set to video playback mode.

3 Press INPUT SELECT on the remote repeatedly to select "DV."

The front panel display changes as follows:

Channel* number → L1 → L2 → L3 → DV

* Does not appear when "Set Top Box Control" is set to "On."

4 Press REC MODE on the remote repeatedly to select the recording mode.

The recording mode changes as follows:

HQ → HSP → SP → LP → EP → SLP

For details about the recording mode, see page 45.

5 Press TOOLS on the remote to select "DV/D8 Audio Input," and press ENTER. Then, select the setting for the audio input.

"Stereo1" (default): Records original sound only. Normally select this when dubbing a DV format tape.
"Mix": Records both stereo 1 and 2.
"Stereo2": Records additional audio only.
Select "Mix" or "Stereo2" only if you have added a second audio channel when recording with your digital video camera.
You are ready to start dubbing. Select one of the dubbing methods on the following pages.

Hints

- You can turn off the recorder during dubbing. The recorder completes dubbing even after being turned off.
- You can adjust the settings for the recording picture before recording. See "Adjusting the recording picture quality and size" (page 51).

Notes

- You cannot connect more than one piece of digital video equipment to the recorder.
- You cannot control the recorder using another device or another recorder of the same model.
- You cannot record date, time, or the contents of the cassette memory onto the disc.
- If you record from a DV/Digital8 format tape with a sound track that is recorded in multiple sampling frequencies (48 kHz, 44.1 kHz, or 32 kHz), no sound or an unnatural sound will be output when playing back the sampling frequency switch point on the disc.
- In order to use this recorder's Auto Scene Chaptering function (pages 79, 80), be sure to correctly set the clock on your digital video camera before shooting.
- The recorded picture may be momentarily affected if the picture size of the source image changes, or if there is nothing recorded on the tape.

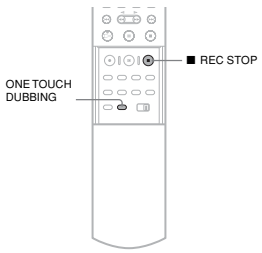
Recording an Entire DV/Digital8 Format Tape (One Touch Dubbing)

HDD +RW -RW VR -RW Video +R -R

You can record the entire contents of a DV/Digital8 format tape onto a disc with a single press of the ONE TOUCH DUBBING button. The recorder controls the digital video camera for the whole process, and completes the recording.

◆How chapters are created

The dubbed contents on the disc become one title, and the title is divided into chapters. For the HDD and a DVD-RW (VR mode), every shooting on the tape becomes a chapter on the disc (Auto Scene Chaptering function). For other discs, the recorder divides the title in either 6 or 15-minute intervals, according to the setting in "Auto Chapter" in Features Setup.



Follow steps 1 to 5 of "Preparing for recording using the DV IN jack" (page 77), and press ONE TOUCH DUBBING on the remote.

The recorder rewinds the tape and then starts recording the tape contents.
When the recording is finished, the recorder rewinds the tape in the digital video camera.

To stop during recording

Open the remote's cover and press ■ REC STOP. Note that it may take a few seconds for the recorder to stop recording.

Hints

- If you set "Finalize Disc" to "Auto" in Features Setup (page 93), the recorded disc (except DVD-RW(VR mode)) will automatically be finalized after recording is finished.
- You can play back a previously recorded title on the HDD while One Touch Dubbing is in progress.

Notes

- When a blank space between the recordings on the tape continues for more than five minutes, One Touch Dubbing ends automatically.
- The recorder records a blank for five minutes before it stops dubbing. To stop the blank recording, press ■ REC STOP.

Program Edit

HDD +RW -RWVR -RWVideo +R -R

You can select scenes from a DV/Digital8 format tape, and then automatically record selected scenes to a disc of your choice.

To use this function, you will do the following:

Connect your digital video camera and prepare for recording

↓

Select and edit the scenes you want to dub

Using the recorder's remote control, fast forward or rewind the tape to select the scenes. At this point, the selected scenes are not copied to the disc. The recorder only remembers the IN and OUT points of the scenes that you selected for dubbing. You can also reset, erase, or change the order of the scenes.

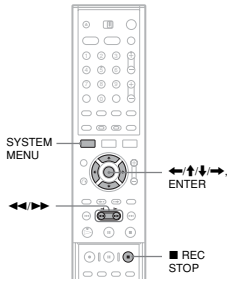
↓

Dub the selected scenes to a disc

After you have selected the scenes, the recorder will fast forward and rewind the tape automatically and record the scenes to a disc of your choice.

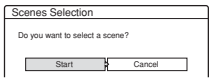
◆How chapters are created

The dubbed contents on the disc become one title, and the title is divided into chapters. For a DVD-RW (VR mode) and the HDD, every shooting on the tape and each selected scene becomes a chapter on the disc (Auto Scene Chaptering function). For other discs, the recorder divides the title in either 6 or 15-minute intervals, according to the setting in "Auto Chapter" in Features Setup.



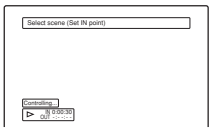
1 Follow steps 1 to 5 of "Preparing for recording using the DV IN jack" (page 77), and press SYSTEM MENU.

2 Select "DV/D8 EDIT," and press ENTER.
The display asks if you want to start selecting scenes.

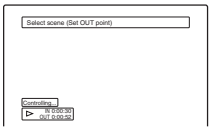


• If you have previously saved a program, the display asks if you want to edit an existing program or to create a new program. To resume editing the existing program, select "Saved Data," and go to step 6.

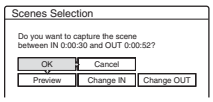
3 Select "Start," and press ENTER.
The display for setting the IN point (start of the scene) appears.
The scene starts to play in the background.



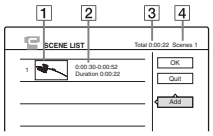
4 Select the IN point by pressing ◀◀/▶▶, and press ENTER.
The display for setting the OUT point (end of the scene) appears. The scene starts to play in the background from the IN point.



5 Select the OUT point by pressing ◀◀/▶▶, and press ENTER.
The display asks if you want to add the selected scene to the Scene List menu. To preview the scene, select "Preview." To reset either the IN or OUT point, select "Change IN" or "Change OUT," and repeat from step 4.



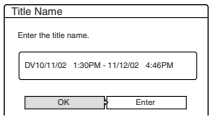
6 Select "OK," and press ENTER.
A new Scene List menu appears with the selected scene.



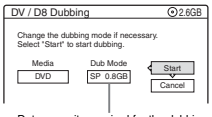
1 Thumbnail picture
2 Time information
3 Total duration of the program
4 Total number of scenes

7 When you finish adding scenes, select the scene you want to edit, and press ENTER.
The sub-menu appears.
"Move": Changes the scene order. Follow the explanations on the screen to change the order by pressing ↑/↓ and ENTER.
"Erase": Erases the scene. When asked for confirmation, select "OK."
"Preview": Plays the selected scene.
"Change IN": Changes the start of the scene. Repeat from step 4.
"Change OUT": Changes the end of the scene. Repeat from step 5.

8 When you finish editing the Scene List, select "OK," and press ENTER.
The display for entering the title name appears. To enter a new name, select "Enter," and follow the explanations on page 43.



9 Select "OK," and press ENTER.
The default title name is fixed, and the display asks if you want to start recording. To change the disc media, select "Media" and press ↑/↓. To change the dubbing mode, select "Dub Mode" and press ↑/↓.



10 Select "Start," and press ENTER.
The recorder starts recording the tape contents as programmed.
• If the recording does not fit due to the dubbing mode you selected, the display asks if you want to continue. To change the dubbing mode, select "Reset" and repeat from step 9. To have the recorder adjust the dubbing mode, select "Auto Dub Mode."
• If there is not enough disc space even after changing the dubbing mode, the display asks if you want to record halfway. To continue, select "OK."

To stop during recording

Open the remote's cover and press ■ REC STOP. Note that it may take a few seconds for the recorder to stop recording.

Notes

• The disc may not be recorded as programmed if the tape's time code is not sequential or there are blanks between the recordings on the tape. In this case, see "Recording From a VCR or Similar Device" (page 53).
• The start and end points of a program may be different from what you have set if the source DV/Digital8 format tape is in any of the following conditions:
– Recording mode was changed during the recording.
– There is a blank space in the recorded portion of the tape.
• If you set the beginning of the tape as the IN point and the end point as the OUT point, the IN and OUT points may change slightly during dubbing.
• You cannot set a scene to be shorter than one second.

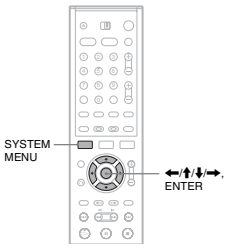
Settings and Adjustments

Using the Setup Displays

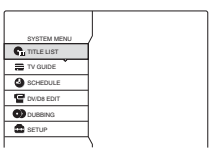
By using the Setup Displays, you can make various adjustments to items such as picture and sound, as well as select a language for the subtitles.
The Setup Displays are used in the following way.

Note

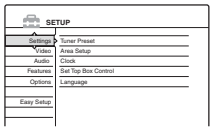
Playback settings stored in the disc take priority over the Setup Display settings, and not all of the functions described may work.



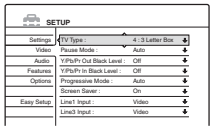
1 Press SYSTEM MENU while the recorder is in stop mode.
The System Menu appears.



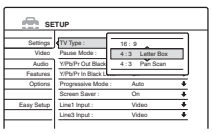
2 Select "SETUP," and press ENTER.
The Setup Display appears.



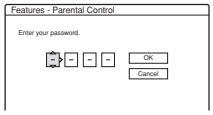
3 Select "Settings," "Video," "Audio," "Features," "Options," or "Easy Setup," and press ENTER.
The selected Setup Display appears.
Example: "Video" setup


SETUP
TV Type : 4 : 3 Letter Box
Pause Mode : Auto
Y/Pb/Pr Out Black Level : Off
Y/Pb/Pr In Black Level : Off
Progressive Mode : Auto
Screen Saver : On
Line1 Input : Video
Line3 Input : Video

4 Select the item you want to set up, and press ENTER.
Available options for the item appear.
Example: "TV Type"

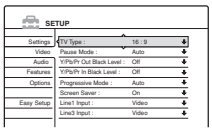


Some items display a dialog box that provides further detailed settings.
Example: The following dialog box appears when “Parental Control” in Features Setup is selected.



In this case, see “Parental Control” in “Recording and Parental Control Settings (Features)” (page 92).

5 Select an option, and press ENTER.
The currently selected option is displayed next to the setup item.
Example: when “16:9” is set.

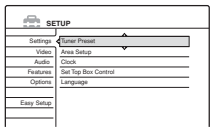


To turn off the display
Press SYSTEM MENU repeatedly.

Antenna Reception and Language Settings (Settings)

The Settings Setup helps you to make tuner, clock, and language settings for the recorder.

Select “Settings” in the Setup Display. To use the display, see “Using the Setup Displays” (page 83).



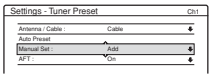
Tuner Preset

Notes

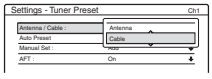
- You cannot presets channels for the connected cable box or satellite receiver.
- You cannot select “Tuner Preset” when you set “Set Top Box Control” to “On.”

Auto Preset
Automatically presets the receivable channels. The recorder can receive VHF channels 2 to 13, UHF channels 14 to 69, and unscrambled CATV channels 1 to 125. First, we recommend that you preset the receivable channels in your area using automatic presetting methods.

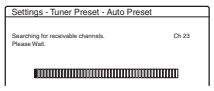
1 Follow steps 1 to 3 of “Using the Setup Displays” (page 83) to select “Settings” in the Setup Display.
2 Select “Tuner Preset,” and press ENTER.



3 Select “Antenna/Cable,” and press ENTER.

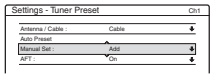


“Cable”: Presets cable TV channels.
“Antenna”: Presets VHF and UHF channels.
4 Select an option, and press ENTER.
5 Select “Auto Preset,” and press ENTER.
All receivable channels are preset in numerical sequence.

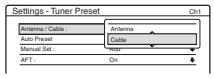


Manual Set
Presets or disables channels manually.
If some channels could not be set using the Auto Preset or Easy Setup function, you can set them manually.

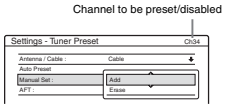
1 Follow steps 1 to 3 of “Using the Setup Displays” (page 83) to select “Settings” in the Setup Display.
2 Select “Tuner Preset,” and press ENTER.



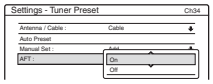
3 Select “Antenna/Cable,” and press ENTER.



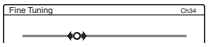
“Cable”: Presets cable TV channels.
“Antenna”: Presets VHF and UHF channels.
4 Select the channel you want to preset using the number buttons and the SET button.
To disable a channel, select the channel using CH +/–.



5 Select “Manual Set,” and press ENTER.
“Add”: Presets the channel.
“Erase”: Disables the channel.
6 Select “Add” to preset the channel, and press ENTER.
7 Select “AFT” and press ENTER.



“On”: Turns on the Auto Fine Tuning function. Normally, select this.
“Off”: Allows you to adjust the picture manually.
8 Select “On” to turn on AFT, and press ENTER.
To preset or disable another channel, repeat from step 3.
- If the Auto Fine Tuning function does not work effectively, select “Off” in step 7 and press ENTER. When the fine tuning bar appears, press ←/→ to obtain a clearer picture, and press ENTER.



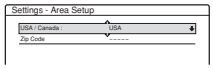
9 To preset or disable another channel, repeat steps 4 to 8.

Area Setup

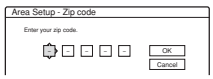
Sets up your area and zip code number. You need to set this correctly to use the TV Guide On Screen system.

➡continued

1 Follow steps 1 to 3 of “Using the Setup Displays” (page 83) to select “Settings” in the Setup Display.
2 Select “Area Setup,” and press ENTER.



3 Select “USA/Canada,” and press ENTER.
4 Select your country, and press ENTER.
5 Select “Zip Code,” and press ENTER.

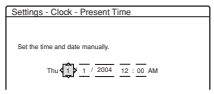


6 Enter your zip code number using the ←/↑/↓/→ buttons, and press ENTER.
7 Select “OK,” and press ENTER.

Clock

Manual Clock Set
Sets the clock manually.

1 Follow steps 1 to 3 of “Using the Setup Displays” (page 83) to select “Settings” in the Setup Display.
2 Select “Clock,” and press ENTER.



3 Press ↑/↓ to set the month, and press →. Set the day, year, hour, and minutes in sequence. Press ←/→ to select the item to be set, then press ↑/↓ to set the numbers. The day of the week is set automatically.
4 Press ENTER to start the clock.

Hint
To change the numbers in step 3, press ← to return to the item to be changed, and select the numbers by pressing ↑/↓.

Note
If the clock data is received automatically, “Clock” cannot be selected from “Settings” in the Setup Display.

Set Top Box Control

You can control your cable box/satellite receiver using the supplied set top box controller. See “Step 7: Easy Setup” for details.

Set Top Box Control

On	Turns on the cable box/satellite receiver control function. See “Using the cable box/satellite receiver control function” (page 12).
Off	Turns off the cable box/satellite receiver control function. Select this if you do not want to use the supplied set top box controller.

When “Set Top Box Control” is set to “On,” you can make the following settings. Note that when you change “Set Top Box Control” to “On” or “Off,” all of the timer recording settings will be canceled.

◆Brand Code
See “Cable Box/Satellite Receiver Brand Code” (page 112) for the brand code for your cable box or satellite receiver, and enter the code using the number buttons and ENTER.

◆Connection
Selects the connection you used for your cable box or satellite receiver. When the cable box or satellite receiver is connected to the recorder’s LINE IN jacks, select the connection from “Line1,” “Line2,” or “Line3.” When the cable box or satellite receiver is connected to the recorder’s VHF/UHF IN jack, select the output channel, “Ch2,” “Ch3,” or “Ch4.”

◆Ch. digit lock
Allows you to select whether to fix the digits for your cable box or satellite receiver.

Off	Select this when your cable box or satellite receiver only accepts a three or more digit channel number. Normally select this.
Lock to two digits	Select this only when your cable box or satellite receiver only accepts a two digit channel number.

◆Mode for SET button
Select “Mode 1” or “Mode 2” if your cable box or satellite receiver requires pressing an ENTER button or a SET button etc., after entering the channel number. If “Mode 1” does not work, try “Mode 2.” If your cable box or satellite receiver does not respond to either setting, contact the manufacturer of the cable box or satellite receiver.

Off	No code is sent when SET is pressed. Normally select this.
Mode 1	Sends the channel number you entered.
Mode 2	Sends the channel number you entered.

Language

OSD (On-Screen Display)
Switches the display language on the screen.

DVD Menu (DVD VIDEO only)
Switches the language for the DVD menu.

Audio (DVD VIDEO only)
Switches the language of the sound track.
When you select “Original,” the language given priority in the disc is selected.

Subtitle (DVD VIDEO only)
Switches the language of the subtitles recorded on the disc.
When you select “Audio Follow,” the subtitle language changes according to the language you selected for the sound track.

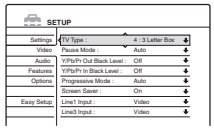
Hint
If you select “Others” in “DVD Menu,” “Subtitle,” or “Audio,” select and enter a language code from “Language Code List” (page 111) using the number buttons.

Note
If you select a language in “DVD Menu,” “Subtitle,” or “Audio” that is not recorded on the DVD VIDEO, one of the recorded languages will be automatically selected.

Video Settings (Video)

Video settings will adjust items related to the image, such as size and color.
Choose the settings according to the type of TV, tuner, or decoder connected to the DVD recorder.

1 Press SYSTEM MENU while the recorder is in stop mode.
2 Select “SETUP,” and press ENTER.
3 Select “Video,” and press ENTER.
The Video Setup appears with the following options. The default settings are underlined.



TV Type
Selects the aspect ratio of the connected TV (4:3 standard or wide).

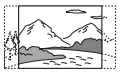
16:9	Select this when connecting to a wide-screen TV or TV with a wide mode function.
4:3 Letter Box	Select this when connecting to a 4:3 screen TV. Displays a wide picture with bands on the upper and lower portions of the screen.
4:3 Pan Scan	Select this when connecting to a 4:3 screen TV. Automatically displays a wide picture on the entire screen and cuts off the portions that do not fit.

➡continued

16:9

4:3 Letter Box

4:3 Pan Scan



Note

Depending on the disc, "4:3 Letter Box" may be selected automatically instead of "4:3 Pan Scan" or vice versa.

Pause Mode (DVDs only)

Selects the picture quality in pause mode.

Auto	The picture, including subjects that move dynamically, is output with no jitter. Normally select this position.
Frame	The picture, including subjects that do not move dynamically, is output in high resolution.

Y/Pb/Pr Out Black Level

Selects the black level (setup level) for the video signals output from the COMPONENT VIDEO OUT jacks (page 17).
This setting is not effective when the PROGRESSIVE indicator lights up on the front panel and the recorder outputs progressive signals.

On	Raises the standard black level. Select this when the picture appears too dark.
Off	Sets the black level of the output signal to the standard level. Normally, select this.

Y/Pb/Pr In Black Level

Selects the black level (setup level) for the NTSC video signals input from the COMPONENT VIDEO IN jacks (page 13). This setting is available when "Line1 Input" is set to "Component" (page 89).

On	Raises the standard black level. Select this when the picture appears too bright.
Off	Sets the black level of the input signals to the standard level. Normally, select this.

Progressive Mode

DVD software can be divided into two types: film based software and video based software. Video based software is derived from TV, such as dramas and sit-coms, and displays images at 30 frames/60 fields per second. Film based software is derived from film and displays images at 24 frames per second. Some DVD software contains both Video and Film.
In order for these images to appear natural on your screen when output in PROGRESSIVE mode, the progressive video signal needs to be converted to match the type of DVD software that you are watching.
You can fine-tune the progressive 480p video signals that are output when you press PROGRESSIVE ("PROGRESSIVE" lights up). Note that you must connect to a progressive format TV using the COMPONENT VIDEO OUT jacks (page 17).

Auto	Automatically detects the software type (Film-based or Video-based) and selects the appropriate conversion mode. Normally select this position.
Video	Fixes the conversion mode to the mode for Video-based software.

Screen Saver

The screen saver image appears when you do not use the recorder for more than 10 minutes while an on-screen display, such as the System Menu, is displayed on your TV screen. The screen saver image helps prevent your display device from becoming damaged (ghosting).

On	Turns on the screen saver function.
Off	Turns off the function.

Line1 Input

Selects a method of inputting video signals for the LINE IN 1 jack on the rear panel of the recorder.

Video	Inputs video signals.
S Video	Inputs S video signals.
Component	Inputs component-video signals.

Line3 Input

Selects the method of inputting video signals for the LINE IN 3 jack on the rear panel of the recorder. The pictures will not be clear if this setting does not match the type of video input signal.

Video	Inputs video signals.
S Video	Inputs S-video signals.

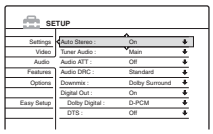
Audio Settings (Audio)

The Audio Setup allows you to adjust the sound according to the playback and connection conditions.

1 Press SYSTEM MENU while the recorder is in stop mode.

2 Select "SETUP," and press ENTER.

3 Select "Audio," and press ENTER.
The Audio Setup appears with the following options. The default settings are underlined.



Auto Stereo

This function is effective only when "Tuner Audio" is set to "Main."

On	Receives stereo programs. Normally select this.
Off	Select this to reduce noise. The sound changes to monaural.

Tuner Audio

Selects the sound to be recorded.

Main	Records only the main sound.
SAP	Records only the SAP (Second Audio Program) sound.

Note

If no SAP sound is received, the main sound is recorded regardless of the setting.

➡continued

Audio ATT (attenuation)

If the playback sound is distorted, set this item to "On." The recorder reduces the audio output level. This function affects the output of the following jacks:
– LINE OUT (AUDIO L/R) 1/2 jacks

On	Select this when the playback sound from the speakers is distorted.
Off	Normally select this position.

Audio DRC (Dynamic Range Control) (DVDs only)

Makes the sound clear when the volume is turned down when playing a DVD that conforms to "Audio DRC." This affects the output from the following jacks:
– LINE OUT (AUDIO L/R) 1/2 jacks
– DIGITAL OUT (OPTICAL or COAXIAL) jack only when "Dolby Digital" is set to "D-PCM."

Standard	Normally select this position.
TV Mode	Makes low sounds clear even if you turn the volume down.
Wide Range	Gives you the feeling of being at a live performance.

Downmix (DVDs only)

Switches the method for mixing down to two channels when you play a DVD which has rear sound elements (channels) or is recorded in Dolby Digital format. For details on the rear signal components, see "Checking the Play Information and Playing Time" (page 41). This function affects the output of the following jacks:
– LINE OUT (AUDIO L/R) 1/2 jacks
– DIGITAL OUT (OPTICAL or COAXIAL) jack when "Dolby Digital" is set to "D-PCM."

Dolby Surround	Normally select this position. Multi-channel audio signals are output to two channels for enjoying surround sounds.
Normal	Multi-channel audio signals are downmixed to two channels for use with your stereo.

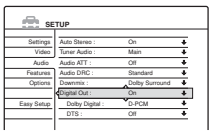
Digital Out

Selects if audio signals are output via the DIGITAL OUT (OPTICAL or COAXIAL) jacks.

On	Normally select this position. When you select "On," see "To set the digital output signal" for further settings.
Off	The influence of the digital circuit upon the analog circuit is minimal.

◆To set the digital output signal

The following setup items switch the method of outputting audio signals when you connect a component such as an amplifier (receiver) with a digital input jack.
For connection details, see "Connecting the Audio Cords" (page 19).
Select "Dolby Digital" and "DTS" after setting "Digital Out" to "On."



If you connect a component that does not accept the selected audio signal, a loud noise (or no sound) will come out from the speakers, and may affect your ears or cause speaker damage.

• Dolby Digital (HDD/DVDs only)
Selects the type of Dolby Digital signal.

D-PCM	Select this when the recorder is connected to an audio component lacking a built-in Dolby Digital decoder. You can select whether the signals conform to Dolby Surround (Pro Logic) or not by making adjustments to the "Downmix" item in Audio Setup (page 90).
Dolby Digital	Select this when the recorder is connected to an audio component with a built-in Dolby Digital decoder.

• DTS (DVD VIDEO only)
Selects whether or not to output DTS signals.

On	Select this when the recorder is connected to an audio component with a built-in DTS decoder.
Off	Select this when the recorder is connected to an audio component without a built-in DTS decoder.

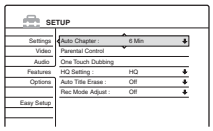
Recording and Parental Control Settings (Features)

The Features Setup allows you to adjust recording and parental control settings.

1 Press SYSTEM MENU while the recorder is in stop mode.

2 Select "SETUP," and press ENTER.

3 Select "Features," and press ENTER.
The Features Setup appears with the following options. The default settings are underlined.



Auto Chapter

Automatically divides a recording (a title) into chapters by inserting chapter markings at a specified interval. The markings are inserted while the recording is being made.

Off	No chapter mark is inserted.
6Min	Inserts chapter marks at approximately 6-minute intervals.
15Min	Inserts chapter marks at approximately 15-minute intervals.

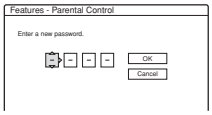
Notes

- Depending upon the size of the recording being made, the actual interval may vary from the interval selected in "Auto Chapter." The selected interval should only be used as an approximation to create chapters.
- This function is not available when dubbing DV/Digital8 format tapes to HDD and DVD-RWs (VR mode). Chapter marks are automatically entered where the recordings start on the tape (pages 79, 80).

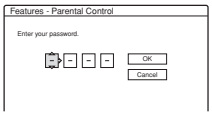
➡continued

Parental Control (DVD VIDEO only)
Playback of some DVD VIDEOs can be limited according to a predetermined level, such as the age of the users. Scenes may be blocked or replaced with different scenes.

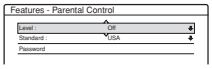
1 After step 3 above, select “Parental Control,” and press ENTER.
- If you have not entered a password, the display for registering a new password appears.



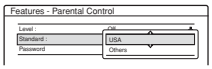
- When you have already registered a password, the display for entering the password appears.



2 Enter your four-digit password using the number buttons, then select “OK” and press ENTER.

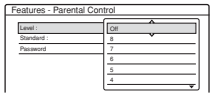


3 Select “Standard,” and press ➡ or ENTER. The selection items for “Standard” are displayed.



4 Select a geographic area as the playback limitation level, and press ENTER.
The area is selected.
- When you select “Others,” press the number buttons to select and enter an area code in the table (see below). Then select “OK” and press ENTER.

5 Select “Level,” and press ENTER.
The selection items for “Level” are displayed.



The lower the value, the stricter the limitation. Discs rated higher than the selected level will be restricted.

6 Select the level, and press ENTER.
The Parental Control setting is complete.

To cancel the Parental Control setting for the disc, set “Level” to “Off” in step 6.
To change the password, select “Password” in step 3, and press ENTER. When the display for registering a password appears, enter a new four-digit password using the number buttons, then select “OK” and press ENTER.

Notes
- If you forget your password, you will have to reset it by selecting “Parental Control” under “Factory Setup” in Options Setup (page 94).
- When you play discs which do not have the Parental Control function, playback cannot be limited on this recorder.
- Depending on the disc, you may be asked to change the Parental Control level while playing the disc. In this case, enter your password, then change the level.

◆Area code

Standard	Code number
Argentina	2044
Australia	2047
Austria	2046
Belgium	2057
Brazil	2070
Canada	2079
Chile	2090
China	2092
Denmark	2115
Finland	2165
France	2174
Germany	2109
India	2248
Indonesia	2238
Italy	2254
Japan	2276
Korea	2304
Malaysia	2363
Mexico	2362
Netherlands	2376
New Zealand	2390
Norway	2379
Pakistan	2427
Philippines	2424
Portugal	2436
Russia	2489
Singapore	2501
Spain	2149
Sweden	2499
Switzerland	2086
Thailand	2528
United Kingdom	2184

One Touch Dubbing
Displays the following options for the One Touch Dub function.

◆Finalize Disc (for all recordable discs except DVD-RW in VR mode)
Selects whether or not to finalize the disc automatically following One Touch Dubbing (page 79).

Auto	Automatically finalizes the disc following One Touch Dubbing.
Manual	Allows you to finalize the disc manually.

HQ Setting (HDD only)
Selects the HQ mode used for recording on the HDD (page 45).

HQ+	Records in higher quality (approximate 15 Mbps).
HQ	Records in the standard HQ mode.

Auto Title Erase (HDD only)

On	Automatically erases old titles recorded on the HDD (page 47).
Off	Turns off the function.

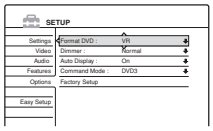
Rec Mode Adjust

On	Automatically adjusts the recording mode to enable the entire program to be recorded (page 47).
Off	Turns off the function.

Disc and Remote Control Settings/Factory Settings (Options)

The Options Setup allows you to set up other operational settings.

1 Press SYSTEM MENU while the recorder is in stop mode.
2 Select “SETUP,” and press ENTER.
3 Select “Options,” and press ENTER.
The Options Setup appears with the following options. The default settings are underlined.



Format DVD (DVD-RW only)
The recorder automatically starts formatting in VR mode or Video mode, whichever is selected below, when a new, unformatted DVD-RW is inserted.

VR	Automatically formats the disc in VR mode.
Video	Automatically formats the disc in Video mode.

Dimmer
Adjusts the lighting of the front panel display.

Normal	Bright lighting.
Power Save	Low lighting. Turns off the lighting when the power is off.

Auto Display

On	Automatically displays information on the screen when the recorder is turned on, etc.
Off	Displays information only when DISPLAY is pressed.

Command Mode
Changes the Command Mode of the recorder if other DVD equipment is assigned the same Command Mode. Be sure to match the Command Mode switch on the remote to the setting made here. For details, see “If you have a Sony DVD player or more than one Sony DVD recorder” on page 23.

DVD1	Select this if the default Command Mode conflicts with other DVD equipment.
DVD2	Select this if the default Command Mode conflicts with other DVD equipment.
DVD3	The default Command Mode of the recorder.

Factory Setup
Allows you to select the setup settings by group, and return them to their default settings. Note that all of your previous settings will be lost.

1 After step 3 above, select “Factory Setup,” and press ➡ or ENTER.
The display for selecting a group of settings appears.

2 Select the group of settings you want to return to default from “Settings,” “Video,” “Audio,” “Features,” “Options,” “Parental Control,” and “All,” and press ➡ or ENTER.

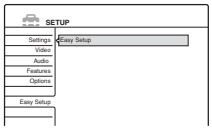
3 Select “Start,” and press ENTER.
The selected settings return to their default settings.

4 Press ENTER when “Finish” appears.

Easy Setup (Resetting the Recorder)

Select this to run the Easy Setup program.

1 Press SYSTEM MENU while the recorder is in stop mode.
2 Select “SETUP,” and press ENTER.
3 Select “Easy Setup,” and press ENTER.



4 Press ENTER.
5 Select “Start,” and press ENTER.
6 Follow the instructions for Easy Setup (page 24) from step 5.

Troubleshooting

If you experience any of the following difficulties while using the recorder, use this troubleshooting guide to help remedy the problem before requesting repairs. Should any problem persist, consult your nearest Sony dealer.

Power

The power does not turn on.
➡ Check that the AC power cord is connected securely.

Picture

There is no picture.
➡ Re-connect all connecting cords securely.
➡ The connecting cords are damaged.
➡ Check the connection to your TV (page 12).
➡ Switch the input selector on your TV (such as to "VCR") so that the signal from the recorder appears on the TV screen.

Picture noise appears.
➡ If the picture output signal from your recorder passes through your VCR to get to your TV, or if you are connected to a combination TV/VIDEO player, the copy-protection signal applied to some DVD programs could affect picture quality. If you still experience this problem even when you connect your recorder directly to your TV, try connecting your recorder to your TV's S VIDEO input.
➡ You have set the recorder to progressive format (the PROGRESSIVE indicator lights up) even though your TV cannot accept the progressive signal. In this case, press PROGRESSIVE until the progressive indicator turns off.
➡ Even if your TV is compatible with progressive format (480p) signals, the image may be affected when you set the recorder to progressive format. In this case, press PROGRESSIVE so that the PROGRESSIVE indicator turns off and the recorder is set to normal (interlace) format.
➡ Noise may sometimes appear in pictures recorded on the HDD, which is due to the characteristics of HDD, and is not a malfunction.

TV program reception does not fill the screen.
➡ Set the channel manually in "Tuner Preset" in Settings Setup (page 84).
➡ Select the correct source using the INPUT SELECT button, or select a channel of any TV program using the CH +/– buttons.

TV program pictures are distorted.
➡ Reorient the TV antenna.
➡ Adjust the picture (see the TV's instruction manual).
➡ Place the recorder and TV farther apart.
➡ Place the TV and any bunched antenna cables farther apart.
➡ The RF cable is connected to the VHF/UHF OUT jack on the recorder. Connect the cable to the VHF/UHF IN jack.

The channel on the cable box/satellite receiver has been changed.
➡ The set top box controller is connected and "Set Top Box Control" is set to "On." Check the "Set Top Box Control" settings in Settings Setup (page 86).

TV channels cannot be changed.
➡ The channel is disabled (page 85).
➡ A timer recording started, which changed the channels.

The picture from equipment connected to the recorder's input jack does not appear on the screen.
➡ If the equipment is connected to the LINE IN 1 jack, select "L1" in the front panel display by pressing CH +/– or INPUT SELECT.
If the equipment is connected to the LINE 2 IN jacks, select "L2" in the front panel display by pressing CH +/– or INPUT SELECT.
If the equipment is connected to the LINE IN 3 jack, select "L3" in the front panel display by pressing CH +/– or INPUT SELECT.
If the equipment is connected to the DV IN jack, (this is usually for a digital video camera connection), select "DV" in the front panel display by pressing CH +/– or INPUT SELECT.
➡ When the equipment is connected to the COMPONENT VIDEO IN jacks using a component video cord, set "Line1 Input" in Video Setup to "Component" (page 89).
➡ When an S video cable is connected to the recorder's LINE IN 1 or LINE IN 3 jack, set "Line1 Input" or "Line3 Input" in Video Setup to "S Video" (page 89).

The playback picture or TV program from the equipment connected through the recorder is distorted.
➡ If the playback picture output from a DVD player, VCR, or tuner goes through your recorder before reaching your TV, the copy-protection signal applied to some programs could affect picture quality. Disconnect the playback equipment in question and connect it directly to your TV.

The picture does not fill the screen.
➡ Set "TV Type" in Video Setup in accordance with the aspect ratio of your TV (page 87).

The picture does not fill the screen, even though the aspect ratio is set in "TV Type" in Video Setup.
➡ The aspect ratio of the title is fixed.

TV Guide On Screen

TV Guide On Screen does not appear.
➡ ①Even if you complete Easy Setup, TV program listings do not appear until the recorder receives the TV Guide On Screen data. ②Turn off the recorder, but do not unplug it. ③Wait for 24 hours. It may take several days for the recorder to receive the TV Guide On Screen data for all channels.
➡ The area and/or zip code is incorrect. Correctly set your area of residence and zip code in "Area Setup" of the Settings Setup (page 85).
➡ When the recorder is connected to a cable box, the cable box must be turned on and "Set Top Box Control" in Settings Setup must be set to "On" (page 86) to download the TV Guide On Screen data.
➡ The cable box/satellite receiver brand code is incorrect (page 112).
➡ The TV Guide On Screen data may not be available in some areas.
➡ TV Guide On Screen does not appear if you connect your TV using the video or S-video jacks and press the PROGRESSIVE button on the remote, even if your TV accepts progressive signals.
➡ The "Time Lock" function on your cable box is activated. Set this function to off.

The channel number in the program listing does not match the broadcast station.
➡ There may be more than one channel lineup for your area. To change the channel lineup, select "Change channel lineup" from "SETUP" in the Main Menu Bar of TV Guide On Screen (page 36).

Program listings for some channels is missing.
➡ It may take several days for the recorded to receive all of the TV Guide On Screen data.
➡ Channels, such as satellite channels, are not displayed by the TV Guide On Screen system.
➡ All of the TV Guide On Screen data could not be received because the reception is poor.

The program listing is not up to date.
➡ The recorder was in use during the time that the TV Guide On Screen data was scheduled to be downloaded.
➡ All of the TV Guide On Screen data could not be received because the reception is poor.

Sound

There is no sound.
➡ Re-connect all connections securely.
➡ The connecting cord is damaged.
➡ The input source setting on the amplifier or the connection to the amplifier is incorrect.
➡ The recorder is in reverse play, fast-forward, slow motion, or pause mode.
➡ If the audio signal does not come through the DIGITAL OUT (OPTICAL or COAXIAL) jacks, check the Audio Setup settings (page 89).

Sound distortion occurs.
➡ Set "Audio ATT" in Audio Setup to "On" (page 90).

Sound is noisy.
➡ When playing a CD with DTS sound tracks, noise will come from the LINE OUT (AUDIO L/R) 1/2 jacks (page 58).

The sound volume is low.
➡ The sound volume is low on some DVDs.

➡continued

The sound volume may improve if you set "Audio DRC" in Audio Setup to "TV Mode" (page 90).
➡ Set "Audio ATT" in Audio Setup to "Off" (page 90).

An alternate audio track cannot be recorded or played.
➡ Second Audio Program (SAP) is not available for all programs. The program you are recording does not have a second audio program.
➡ You have set "Tuner Audio" in Audio Settings to "Main" (page 89). Select "SAP" to record alternate audio programs.
➡ When recording from connected equipment, set "Line Audio Input" in TOOLS menu to "Main/Sub" (page 53).
➡ If you have connected an AV amplifier to the DIGITAL OUT (OPTICAL or COAXIAL) jack and want to change the audio track for a DVD-RW (VR mode) during playback, set "Dolby Digital" in Audio Setup to "D-PCM" (page 90).

Playback

The recorder does not play any type of disc (except HDD).
➡ The disc is upside down. Insert the disc with the labeled side facing up.
➡ The disc is not correctly inserted.
➡ Moisture has condensed inside the recorder. Remove the disc and leave the recorder turned on for about half an hour until the moisture evaporates.
➡ If the disc was recorded on another recorder, the recorder cannot play the disc if it was not finalized (page 40).

The disc does not start playback from the beginning.
➡ Resume play was activated (page 54).
➡ You have inserted a DVD whose Title menu or DVD menu automatically appears on the TV screen when it is first inserted. Use the menu to start playback.

The recorder starts playing the disc automatically.
➡ The DVD VIDEO features an auto playback function.

Playback stops automatically.
➡ If the DVD has an auto pause signal, the recorder stops playback at the auto pause signal.

Some functions such as Stop, Search, or Slow-motion Play cannot be performed.
➡ Depending on the DVD, you may not be able to do some of the operations above. See the instruction manual supplied with the disc.

The language for the sound track cannot be changed.
➡ Multilingual tracks are not recorded on the DVD being played.
➡ The DVD VIDEO prohibits the changing of the language for the sound track.
➡ Try changing the language using the DVD VIDEO's menu.

The subtitle language cannot be changed or turned off.
➡ Multilingual subtitles are not recorded on the DVD VIDEO.
➡ The DVD VIDEO prohibits changing of the subtitles.
➡ Try changing the subtitle using the DVD VIDEO's menu.
➡ The subtitles cannot be changed for the titles recorded on this recorder.

The angles cannot be changed.
➡ Multi-angles are not recorded on the DVD VIDEO being played.
➡ You are trying to change the angles when "" does not appear on the TV screen (page 56).
➡ The DVD VIDEO prohibits changing angles.
➡ Try changing the angle using the DVD VIDEO's menu.
➡ The angles cannot be changed for the titles recorded on this recorder.

The MP3 audio track does not play.
➡ The MP3 audio track is not recorded in a format that the recorder can play (page 62).

Recording/Timer recording/Editing

The channel cannot be changed from the channel you are recording.
➡ Set the TV's input source to "TV."

Recording does not start immediately after you press ● REC.
➡ Operate the recorder only after "LOAD", "FORMAT," or "INFOWRITE" disappears from the front panel display.

Nothing was recorded even though you set the timer setting correctly.
➡ There was a power failure during recording.
➡ The recorder's internal clock stopped due to a power failure that lasted for more than one hour. Reset the clock (page 86).
➡ The channel was hidden after the timer recording was set. (See "To customize the channel line-up" on page 36.)
➡ Disconnect the AC power cord from the AC outlet, and connect it again.
➡ The program contains copy protection signals that restrict copying.
➡ The timer setting overlapped another setting that was set later.
➡ There is no DVD inside the recorder.
➡ There is not enough HDD or DVD disc space for the recording.
➡ The set top box was turned off.
➡ The set top box controller was incorrectly connected (page 13).
➡ The settings in "Set Top Box Control" in Settings Setup have been changed (page 86).
➡ A separate recording was in the process of being made without the use of the timer (page 50).
➡ The recorder was in the process of dubbing (HDD↔DVD).
➡ The recorder was in the process of DV/Digital8 Dubbing.

Recording does not stop immediately after you press ■ REC STOP.
➡ It will take a few seconds for the recorder to input disc data before recording can stop.

Recording does not stop after you press ■ STOP.
➡ Open the remote's cover and press ■ REC STOP.

Timer recording is not complete or did not start from the beginning.
➡ There was a power failure during recording. Should the power failure continue for more than one hour, reset the clock (page 86).
➡ There is not enough HDD or DVD disc space for the recording.

Contents previously recorded were erased.
➡ Data that has been recorded on a DVD with a PC will be erased from the disc when the disc is inserted.
➡ "Auto Title Erase" in Features Setup is set to "On" (page 93).

Display

The clock has stopped.
➡ Set the clock again (page 86).
➡ The clock stopped due to a power failure that lasted for more than one hour. Reset the clock (page 86).

The clock is wrong.
➡ Set the clock again (page 86). If you cannot select "Clock" from "Settings" in the Setup Display, wait until the clock data is received and the clock is automatically adjusted.

The TIMER REC indicator is flashing.
➡ The disc does not have enough space.
➡ Insert a recordable disc inside the recorder.

The recording mode indication is incorrect.
➡ When the recording or dubbing is less than three minutes, the recording mode indication may be displayed incorrectly. The actual recording itself is correctly made in the selected recording mode.

The clock does not appear in the front panel display.
➡ "Dimmer" in Options Setup is set to "Power Save" (page 94).

Remote control

The remote does not function.
➡ Batteries are weak.
➡ The remote is too far from the recorder.
➡ The remote's manufacturer code returned to the default setting when you replaced the batteries. Reset the code (page 21).
➡ Turn on the recorder.
➡ The remote is not pointed at the remote sensor on the recorder.
➡ Different command modes are set for the recorder and remote. Set the same command mode (page 23).

➡continued

➡ Set the TV/DVD switch to DVD (page 22).

Other Sony equipment responds to the remote.
➡ The same command mode is set for both the equipment and recorder. Set a different command mode for the recorder (page 23).

Others

The recorder does not operate properly.
➡ Restart the recorder. Press down I/⏻ on the recorder for more than ten seconds until "WELCOME" appears in the front panel display.
➡ When static electricity, etc., causes the recorder to operate abnormally, turn off the recorder and wait until the clock appears in the front panel display. Then, unplug the recorder and after leaving it off for a while, plug it in again.

Dubbing or DV/Digital8 Dubbing does not start.
➡ A timer recording is in progress.

Five numbers or letters are displayed on the front panel display.
➡ The self-diagnosis function was activated (see the table on page 101).

The disc tray does not open after you press ⏏ OPEN/CLOSE.
➡ It may take a few seconds for the disc tray to open after you have recorded or edited a DVD. This is because the recorder is adding disc data to the disc.

The disc tray does not open and "TRAY LOCKED" appears on the front panel display.
➡ Contact your Sony dealer or local authorized Sony service facility.

"RECOVERY" appears in the front panel display.
➡ The recorder's recovery function was activated when the recorder was turned on because the power was turned off or failed during recording. Leave the recorder on until "RECOVERY" disappears from the front panel display.

"HDD ERROR" appears in the front panel display.
➡ The hard disk error occurred. Press down I/⏻ on the recorder for ten seconds to restart the recorder. If this does not resolve the problem, format the recorder's HDD by pressing down the HDD button on the recorder for more than ten seconds until "WELCOME" appears in the front panel display. Note that all the contents recorded on the HDD will be erased.

"FAN ERROR" appears in the front panel display.
➡ Check that the vent on the rear of the recorder is not blocked. Then, turn off the recorder, wait until the clock appears in the front panel display, and disconnect the AC power cord. Leave the recorder off for a while, then re-connect the power cord, and press I/⏻ on the recorder.

Mechanical sound is heard when the recorder is off.
➡ While the recorder is adjusting the clock or downloading the TV Guide On Screen data, operational noises (such as the internal fan) may be heard, even when the power is off. This is not a malfunction.

The disc tray does not open and you cannot remove the disc after you press ⏏ OPEN/CLOSE.
➡ Turn off the recorder, Once the clock appears in the front panel display, disconnect the AC power cord. Connect it again while pressing down ⏏ on the recorder, and release the button when the disc tray opens. Then, keep I/⏻ on the recorder pressed for about ten seconds until "WELCOME" appears in the front panel display.

"LOCKED" appears in the front panel display.
➡ The disc tray is locked. Cancel the Child Lock (page 55).

Self-diagnosis Function (When letters/numbers appear in the display)

When the self-diagnosis function is activated to prevent the recorder from malfunctioning, a five-character service number (e.g., C 13 50) with a combination of a letter and four numbers appears on the front panel display. In this case, check the following table.

First three characters of the service number	Cause and/or corrective action
C 13	There is a problem with the HDD. ➡ Contact your nearest Sony dealer or local authorized Sony service facility. The DVD is dirty. ➡ Clean the disc with a soft cloth.
C 31	The DVD/CD is not inserted correctly. ➡ Re-insert the disc correctly.
E XX (xx is a number)	To prevent a malfunction, the recorder has performed the self-diagnosis function. ➡ Contact your nearest Sony dealer or local authorized Sony service facility and give the five-character service number. Example: E 61 10

Notes About This Recorder

On operation
- If the recorder is brought directly from a cold to a warm location, or is placed in a very damp room, moisture may condense on the lenses inside the recorder. Should this occur, the recorder may not operate properly. In this case, remove the disc and leave the recorder turned on for about half an hour until the moisture evaporates.
- When you move the recorder, take out any discs. If you don't, the disc may be damaged.

On adjusting volume
- Do not turn up the volume while listening to a section with very low level inputs or no audio signals. If you do, the speakers may be damaged when a peak level section is played.

On cleaning
Clean the cabinet, panel, and controls with a soft cloth slightly moistened with a mild detergent solution. Do not use any type of abrasive pad, scouring powder or solvent such as alcohol or benzine.

About repairing the hard disk drive
- It may be necessary to access data stored on the hard disk for testing purposes; there is no intention to copy or store the data, titles or any other information.
- If replacement or initialization (format) is required, the hard disk will be formatted at our discretion. In this case, please note that all of the contents recorded there will be erased (including any data found to violate copyright law).

On cleaning discs
Do not use a commercially available cleaning disc. It may cause a malfunction.

Notes about the discs
- To keep the disc clean, handle the disc by its edge. Do not touch the surface. Dust, fingerprints, or scratches on the disc may cause it to malfunction.

➡continued

- Do not expose the disc to direct sunlight or heat sources such as hot air ducts, or leave it in a car parked in direct sunlight as the temperature may rise considerably inside the car.
- After playing, store the disc in its case.
- Clean the disc with a cleaning cloth. Wipe the disc from the center out.

- Do not use solvents such as benzine, thinner, commercially available cleaners, or anti-static spray intended for vinyl LPs.
- Do not use the following discs.
  – A disc that has a non-standard shape (e.g., card, heart).
  – A disc with a label or sticker on it.
  – A disc that has cellophane tape or sticker adhesive on it.

Specifications

System
Laser: Semiconductor laser
Channel coverage:
NTSC
VHF: 2 to 13/UHF: 14 to 69/CATV: A-8 to A-1, A to W, W+1 to W+84
Video reception: Frequency synthesizer system
Audio reception: Split carrier system
Antenna: 75-ohm antenna terminal for VHF/UHF
Timer: Clock: Quartz locked/Timer indication: 12-hour cycle (digital)/Power back-up duration: 1 hour
Video recording format: MPEG Video
Audio recording format/applicable bit rate: Dolby Digital, 2 ch/256 kbps

When you play PCM sound tracks with a 96 kHz sampling frequency, the output signals from the DIGITAL OUT (OPTICAL or COAXIAL) jack are converted to 48 kHz sampling frequency.

Inputs
(**Jack name:** Jack type/input level/input impedance)
LINE IN 1/2/3
(AUDIO): Phono jack/2 Vrms/more than 22 kilohms
(VIDEO): Phono jack/1.0 Vp-p
(S VIDEO): 4-pin mini DIN/Y:1.0 Vp-p, C: 0.286 Vp-p
DV IN: 4-pin/i.LINK S100
COMPONENT VIDEO IN (Y, P_B, P_R):
Phono jack/Y: 1.0 Vp-p/P_B/P_R: interlace*=0.648 Vp-p, interlace**=0.7 Vp-p
* "Y/Pb/Pr In Black Level" is "On"
** "Y/Pb/Pr In Black Level" is "Off"
CONTROL S IN: Mini jack

Outputs
(**Jack name:** Jack type/output level/output impedance)
LINE OUT 1/2
(AUDIO): Phono jack/2 Vrms/10 kilohms
(VIDEO): Phono jack/1.0 Vp-p
(S VIDEO): 4-pin mini DIN/Y:1.0 Vp-p, C: 0.286 Vp-p
DIGITAL OUT (OPTICAL):
Optical output jack/–18 dBm (wave length: 660 nm)
DIGITAL OUT (COAXIAL):
Phono jack/0.5 Vp-p/75 ohms
COMPONENT VIDEO OUT (Y, P_B, P_R):
Phono jack/Y: 1.0 Vp-p/P_B, P_R: interlace*=0.648 Vp-p, progressive or interlace**=0.7 Vp-p
* "Y/Pb/Pr Out Black Level" is "On"
** "Y/Pb/Pr Out Black Level" is "Off"
SET TOP BOX CONTROL:
Mini jack

General
Power requirements: 120 V AC, 60 Hz
Power consumption: 54 W
Dimensions (approx.): 430 × 89 × 346 mm ($17 \times 3\,^5/_8 \times 13\,^5/_8$ in.) (width/height/depth) incl. projecting parts
Hard disk drive capacity: 160 GB
Mass (approx.): 5.9 kg (13.01 lb)
Operating temperature: 5 ºC to 35 ºC (41 ºF to 95 ºF)
Operating humidity: 25 % to 80 %
Supplied accessories:
Audio/video cord (1)
Power cord (1)
Antenna cable (1)
Set top box controller (1)
Remote commander (remote) (1)
Size AA(R6) batteries (2)

Specifications and design are subject to change without notice.

About i.LINK

The DV IN jack on this recorder is an i.LINK-compliant DV IN jack. This section describes the i.LINK standard and its features.

What is i.LINK?
i.LINK is a digital serial interface for handling digital video, digital audio and other data in two directions between equipment having the i.LINK jack, and for controlling other equipment.
i.LINK-compatible equipment can be connected by a single i.LINK cable. Possible applications are operations and data transactions with various digital AV equipment. When two or more i.LINK-compatible equipment are connected to this recorder in a daisy chain, operations and data transactions are possible with not only the equipment that this recorder is connected to but also with other devices via the directly connected equipment.
Note, however, that the method of operation sometimes varies according to the characteristics and specifications of the equipment to be connected, and that operations and data transactions are sometimes not possible on some connected equipment.

Note
Normally, only one piece of equipment can be connected to this recorder by the i.LINK cable (DV connecting cable). When connecting this recorder to i.LINK-compatible equipment having two or more i.LINK jacks (DV jacks), see the instruction manual of the equipment to be connected.

About the name "i.LINK"
i.LINK is a more familiar term for IEEE 1394 data transport bus proposed by SONY, and is a trademark approved by many corporations.
IEEE 1394 is an international standard standardized by the Institute of Electrical and Electronics Engineers.

➡continued

i.LINK baud rate

i.LINK's maximum baud rate varies according to the equipment. Three maximum baud rates are defined:
S100 (approx. 100 Mbps*)
S200 (approx. 200 Mbps)
S400 (approx. 400 Mbps)

The baud rate is listed under "Specifications" in the instruction manual of each equipment. It is also indicated near the i.LINK jack on some equipment.
The maximum baud rate of equipment on which it is not indicated such as this unit is "S100."
When units are connected to equipment having a different maximum baud rate, the baud rate sometimes differs from the indicated baud rate.

* What is Mbps?
Mbps stands for megabits per second, or the amount of data that can be sent or received in one second. For example, a baud rate of 100 Mbps means that 100 megabits of data can be sent in one second.

i.LINK functions on this recorder

For details on how to dub when this recorder is connected to other video equipment having DV jacks, see page 77.
The DV jack on this recorder can only input DVC-SD signals. It cannot output signals. The DV jack will not accept MICRO MV signals from equipment such as a MICRO MV digital video camera with an i.LINK jack.
For further precautions, see the notes on page 77.
For details on precautions when connecting this recorder, also see the instruction manuals for the equipment to be connected.

Required i.LINK cable

Use the Sony i.LINK 4-pin-to-4-pin cable (during DV dubbing).

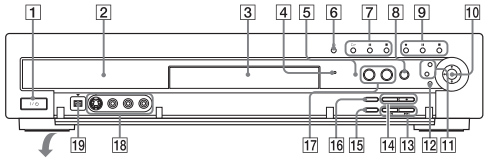
i.LINK and are trademarks.

Guide to Parts and Controls

For more information, see the pages in parentheses.

Front panel

Buttons on the recorder have the same function as the buttons on the remote if they have the same or similar names.

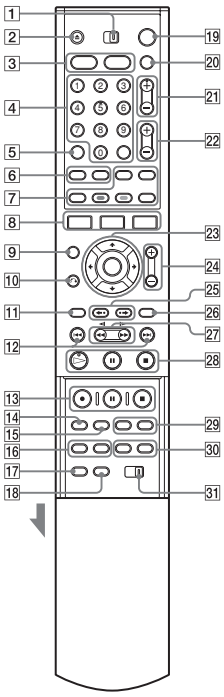


1 I/⏻ (on/standby) button (24)
2 Front panel display (42, 108)
3 Disc tray (46)
4 TIMER REC indicator (46)
5 (remote sensor) (21)
6 ⏏ (open/close) button (46)
7 ▷ (play) button (54)
❚❚ (pause) button (54)
■ (stop) button (54)
8 TV GUIDE button (34, 46)
9 ● REC button (50)
❚❚ REC PAUSE button (50)
■ REC STOP button (50)
10 ←/↑/↓/→/ENTER button (32)
11 SYSTEM MENU button (32)
TOOLS button (32)
12 ↶ RETURN button (32)
13 I◀◀ /▶▶I (previous/next) buttons (56)
14 CHANNEL +/– buttons (50)
15 REC MODE button (45)
16 INPUT SELECT button (53, 77)
17 DVD button/indicator (37)
HDD button/indicator (37)
18 LINE 2 IN (S VIDEO/VIDEO/AUDIO L/R) jacks (30)
19 DV IN jack (77)

→continued

Remote

Buttons on the remote have the same function as the buttons on the recorder if they have the same or similar names. Buttons with an orange dot next to them can be used with your TV when the TV/DVD switch is set to TV.

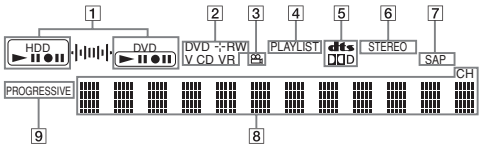


1 TV/DVD switch (22)
2 ⏏ OPEN/CLOSE button (46)
3 HDD button (37)
DVD button (37)
4 Number buttons (22, 48, 61)
SET/● button (22, 48, 61)
The number 5 button has a tactile dot.*
5 CLEAR button (61)
6 AUDIO button (56)*
SUBTITLE button (56)
7 TV GUIDE button (34, 47)
SCHEDULE button (49)
Blue button (34)
Green button (34)
(info) button (34)
TIMER button (48)
8 SYSTEM MENU button (32)
TITLE LIST button (37, 54, 65)
TOOLS button (32)
9 CURSOR MODE button (37)
10 ↶ RETURN/EXIT button (32, 34)
11 TOP MENU button (54)
12 I◀◀ PREV (previous)/▶▶I NEXT buttons (56)
13 ● REC button (50)
❚❚ REC PAUSE button (50)
■ REC STOP button (50)
14 REC MODE button (45)
15 INPUT SELECT button (53, 77)
16 ANGLE button (56)
SUR (surround) button (56)
17 PROGRESSIVE button (18)
18 ONE TOUCH DUBBING button (79)
19 I/⏻ (on/standby) button (24)
20 TV/VIDEO button (22)
21 CH (channel) +/– buttons (22)
The + button has a tactile dot.*
22 VOL (volume) +/– buttons (22)
23 ←/↑/↓/→/ENTER button (32)
24 ZOOM/PAGE +/– buttons (34, 37)
25 ◂• INSTANT REPLAY/•▸ INSTANT ADVANCE buttons (56)
26 MENU button (54)
27 ◀◀/◀❚/❚▶/▶▶ (search) buttons (56)
28 ▷ PLAY button (54)
The button has a tactile dot.*
❚❚ PAUSE button (54)
■ STOP button (54)
29 CHAPTER MARK/ERASE buttons (68)
30 DISPLAY button (41, 52)
TIME/TEXT button (42)
31 COMMAND MODE switch (DVD 1,2,3) (23)

* Use the tactile dot as a reference when operating the recorder.

→continued

Front panel display



1 HDD/DVD indicators
Displays the selected media and the playing/recording/dubbing status.

2 Disc type*/recording format
* Displays DATA CDs as "CD."

3 (angle) indicator (56)

4 PLAYLIST indicator (38)

5 Audio signal indicators (41)

6 STEREO indicator (45)

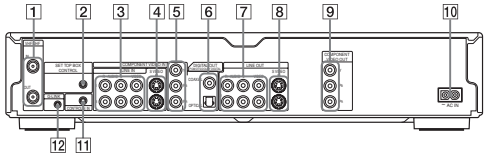
7 SAP (Second Audio Program) indicator (45)

8 Displays the following (42):
- Playing time/remaining time
- Current title/chapter/track/index number
- Recording time/recording mode
- Clock
- Channel

9 PROGRESSIVE indicator (18)

Hint
You can turn off the front panel display when the recorder is turned off by setting "Dimmer" to "Power Save" in Options Setup (page 94).

Rear panel



1 VHF/UHF IN/OUT jacks (14)

2 SET TOP BOX CONTROL jack (13, 14)

3 LINE IN (AUDIO L/R/VIDEO) 1/3 jacks (13, 29)

4 LINE IN (S VIDEO) 1/3 jacks (13, 29)

5 COMPONENT VIDEO IN (Y, P_B, P_R) jack (13, 29)

6 DIGITAL OUT (COAXIAL/OPTICAL) jacks (20)

7 LINE OUT (AUDIO L/R/VIDEO) 1/2 jacks (16, 20)

8 LINE OUT (S VIDEO) 1/2 jacks (16)

9 COMPONENT VIDEO OUT (Y, P_B, P_R) jacks (16)

10 AC IN terminal (21)

11 CONTROL S IN jack (16)

12 G-LINK jack (for service use only)

Glossary

Chapter (page 61)
Sections of a picture or a music feature that are smaller than titles. A title is composed of several chapters. Depending on the disc, no chapters may be recorded.

Copy protection signals (page 46)
Copy restriction set by copyright owners, etc. These signals are included in some software or TV programs and restrict recording on this recorder.

Dolby Digital (page 90)
Digital audio compression technology developed by Dolby Laboratories. This technology conforms to multi-channel surround sound. The rear channel is stereo and there is a discrete subwoofer channel in this format. Dolby Digital provides the same discrete channels of high quality digital audio found in "Dolby Digital" theater surround sound systems. Good channel separation is realized because all of the channel data is recorded discretely, and little deterioration occurs because all channel data processing is digital.

DTS (page 90)
Digital audio compression technology by Digital Theater Systems, Inc. This technology conforms to multi-channel surround sound. The rear channel is stereo and there is a discrete subwoofer channel in this format. DTS provides the same discrete channels of high quality digital audio.
Good channel separation is realized because all of the channel data is recorded discretely, and little deterioration occurs because all channel data processing is digital.

DVD+RW (page 8)
A DVD+RW (read "plus RW") is a recordable and rewritable disc. DVD+RWs use a recording format that is comparable to the DVD VIDEO format.

DVD-RW (page 8)
A DVD-RW is a recordable and rewritable disc that is the same size as a DVD VIDEO. The DVD-RW has two different modes: VR mode and Video mode. DVDs created in Video mode have the same format as a DVD VIDEO, while discs created in VR (Video Recording) mode allow the contents to be programmed or edited.

DVD+R (page 8)
A DVD+R (read "plus R") is a recordable disc that is the same size as a DVD VIDEO. Contents can be recorded only once to a DVD+R, and will have the same format as a DVD VIDEO.

DVD-R (page 8)
A DVD-R is a recordable disc that is the same size as a DVD VIDEO. Contents can be recorded only once to a DVD-R, and will have the same format as a DVD VIDEO.

DVD VIDEO (page 8)
A disc that contains up to eight hours of moving pictures on a disc the same diameter as a CD. The data capacity of a single-layer and single-sided DVD is 4.7 GB (Giga Byte), which is 7 times that of a CD. The data capacity of a double-layer and single-sided DVD is 8.5 GB, a single-layer and double-sided DVD is 9.4 GB, and double-layer and double-sided DVD is 17 GB. The picture data uses the MPEG 2 format, which is a worldwide standard of digital compression technology. The picture data is compressed to about 1/40 (average) of its original size. The DVD also uses a variable rate coding technology that changes the data to be allocated according to the status of the picture. Audio information is recorded in a multi-channel format, such as Dolby Digital, allowing you to enjoy a more real audio presence.
Furthermore, various advanced functions such as the multi-angle, multilingual, and Parental Control functions are provided on the DVD.

→continued

Hard disk drive (page 8)
A hard disk drive is a whole mechanical system that consists of disks and drive. Disks are flat, circular, rigid plates coated with a thin magnetic media. Magnetic heads record data on the rapidly spinning disks, and this enables the speedy and efficient reading and writing of data.

Interlace format (page 18)
Interlace format shows every other line of an image as a single "field" and is the standard method for displaying images on television. The even number field shows the even numbered lines of an image, and the odd numbered field shows the odd numbered lines of an image.

Original (page 64)
Titles actually recorded on a DVD-RW (VR mode). Erasing original titles frees up disc space.

Playlist (page 64)
Playback information created from the actual recordings on a DVD-RW (VR mode). A Playlist leaves the original titles as they are, and contains only the information needed to control playback. A Playlist title takes up very little disc space.

Progressive format (page 18)
Compared to the Interlace format that alternately shows every other line of an image (field) to create one frame, the Progressive format shows the entire image at once as a single frame. This means that while the Interlace format can show 30 frames/60 fields in one second, the Progressive format can show 60 frames in one second. The overall picture quality increases and still images, text, and horizontal lines appear sharper.

Title (page 61)
The longest section of a picture or music feature on a DVD, movie, etc., in video software, or the entire album in audio software.

Track (page 61)
Sections of a music feature on a CD (the length of a song).

Language Code List

For details, see page 87.
The language spellings conform to the ISO 639: 1988 (E/F) standard.

Code	Language	Code	Language	Code	Language	Code	Language
1027	Afar	1183	Irish	1347	Maori	1507	Samoan
1028	Abkhazian	1186	Scots Gaelic	1349	Macedonian	1508	Shona
1032	Afrikaans	1194	Galician	1350	Malayalam	1509	Somali
1039	Amharic	1196	Guarani	1352	Mongolian	1511	Albanian
1044	Arabic	1203	Gujarati	1353	Moldavian	1512	Serbian
1045	Assamese	1209	Hausa	1356	Marathi	1513	Siswati
1051	Aymara	1217	Hindi	1357	Malay	1514	Sesotho
1052	Azerbaijani	1226	Croatian	1358	Maltese	1515	Sundanese
1053	Bashkir	1229	Hungarian	1363	Burmese	1516	Swedish
1057	Byelorussian	1233	Armenian	1365	Nauru	1517	Swahili
1059	Bulgarian	1235	Interlingua	1369	Nepali	1521	Tamil
1060	Bihari	1239	Interlingue	1376	Dutch	1525	Telugu
1061	Bislama	1245	Inupiak	1379	Norwegian	1527	Tajik
1066	Bengali; Bangla	1248	Indonesian	1393	Occitan	1528	Thai
		1253	Icelandic	1403	(Afan)Oromo	1529	Tigrinya
1067	Tibetan	1254	Italian	1408	Oriya	1531	Turkmen
1070	Breton	1257	Hebrew	1417	Punjabi	1532	Tagalog
1079	Catalan	1261	Japanese	1428	Polish	1534	Setswana
1093	Corsican	1269	Yiddish	1435	Pashto; Pushto	1535	Tonga
1097	Czech	1283	Javanese			1538	Turkish
1103	Welsh	1287	Georgian	1436	Portuguese	1539	Tsonga
1105	Danish	1297	Kazakh	1463	Quechua	1540	Tatar
1109	German	1298	Greenlandic	1481	Rhaeto-Romance	1543	Twi
1130	Bhutani	1299	Cambodian			1557	Ukrainian
1142	Greek	1300	Kannada	1482	Kirundi	1564	Urdu
1144	English	1301	Korean	1483	Romanian	1572	Uzbek
1145	Esperanto	1305	Kashmiri	1489	Russian	1581	Vietnamese
1149	Spanish	1307	Kurdish	1491	Kinyarwanda	1587	Volapük
1150	Estonian	1311	Kirghiz	1495	Sanskrit	1613	Wolof
1151	Basque	1313	Latin	1498	Sindhi	1632	Xhosa
1157	Persian	1326	Lingala	1501	Sangho	1665	Yoruba
1165	Finnish	1327	Laothian	1502	Serbo-Croatian	1684	Chinese
1166	Fiji	1332	Lithuanian			1697	Zulu
1171	Faroese	1334	Latvian; Lettish	1503	Singhalese		
1174	French			1505	Slovak		
1181	Frisian	1345	Malagasy	1506	Slovenian	1703	Not specified

Cable Box/Satellite Receiver Brand Code

If more than one code number is listed, try entering them one at a time until you find the one that works with your cable box/satellite receiver.

Cable box brand	Code number
3M	0033
ABC	0003, 0011, 0017, 0008, 0014, 0001, 0013, 0206, 0047, 0237, 0033
Accuphase	0003, 0013, 0047, 0001, 0011, 0017, 0014, 0206
Acorn	1102, 0237
Action	0237
Active	0237, 1102
Aim	0015
Allegro	0315, 0153
Amark	0008, 0277, 0144, 0056
American	0060
Americast	0899
Antronix	0207, 0022
Anvision	0211, 0111
Apache	0770
Arbatron	0014, 0011, 0003, 0476
Archer	0153, 0022, 0207, 0039, 0797, 0237, 0260
ASE	1080
Auna	1269
BBT	0267
BCC	0276
Belcor	0056, 0022
Bell & Howell	0014
Bell Atlantic	0641
Bell South	0899
Bestlink	0303
Betavue	0022
British Telecom	0003
BVS	0641

Cable box brand	Code number
Cable Healthcare	0769, 0058
Cable Star	0056
Cabletenna	0022, 0039
Cableview	0022
Century	0153, 0618, 0008, 0315
Citation	0017
Citizen	0153, 0315, 0078, 0242
Clearmaster	0883
ClearMax	0883, 1247
Colour Voice	0031, 0025
Comband	0233, 0232
Comtec	0274
Comtronics	0060, 0040
Comtronics Eagle	0040, 0060
Contec	0019
Coolmax	0883
Curtis Mathes	0015, 0242
Dae Ryung Eagle	0008
Daeryung	0008, 0877, 0477, 0277, 1877
Diamond	0035
Digeo	1476
Digi	0637
Director	0476
Dumont	0637
Eagle Comtronics	0060, 0028
Eastern	0002, 0274, 0418
Electricord	0078
Emerson	0797, 0303, 0015, 0014
Everquest	0040, 0015
Focus	0400
Fosgate	0276
Funai	0248, 0019
FutureVision	0649
Garrard	0153
Gateway	0764
GC Electronics	0207, 0056, 0330, 0016, 0040, 0077, 0030

Cable box brand	Code number
GE	0232, 0233, 0144, 0021
Gemini	0015, 0070, 0057, 0242, 0014, 0797, 0013, 0400
General Instrument	0476, 0011, 0014, 0098, 0810, 0024, 0003, 0015, 0276
GHZ	0078
Gibraltar	0003
Global	1327
GMI	0069, 0057, 0015, 0797
GoldStar	0144, 0040
Goodmind	0770, 0797
Gradiente	1136
Hamlin	0020, 0009, 0034, 0259, 0015, 0273, 0206
Healthway Interactive	0058, 1020, 1015, 0769
Hitachi	0011, 0154, 0009, 0008, 0003, 0033, 0014, 0255
Houston Tracker	0011
Hwalin	0303
IBM	0670
IEEC	1018
Interbuy	0274
Jasco	0315, 0153, 0015
Jebsee	0014, 0400
Jerrold	0003, 0014, 0276, 0011, 0012, 0020, 0024, 0015, 0047, 0098, 0476, 0031, 0029, 0111, 0032, 0054, 0810, 0028
Kuang Yu	0024
Leon	0069, 0015
LG	0040, 0144
Linsay	0440
Macom	0033
Maestro	0812
Magnavox	0797, 0027, 0032, 0334, 0069
Millennium	0618, 0153
Memorex	0000
Mitsubishi	0003

Cable box brand	Code number
Motorola	0476, 0276, 1476, 0810, 1376, 1254, 0400, 1106
Movie Time	0156, 0078, 0063, 0203
MS	0069, 0015, 1018, 0303
MultiVision	0012
Myrio	1117
NET	0274
Next Level	0764, 1316, 1315, 1314
Nexus	0770
Northcoast	0671, 0314
Nova Vision	0277, 0008
Novabeam	0277
Novaplex	0618, 0277, 0017, 0008
NSC	0156, 0070, 0203, 0063, 0400, 0012, 0618, 0022, 0637, 0010, 0044
Oak	0019, 0303, 0248, 0017
Omega	0015
Omniview	0371
Optimus	0021
Pace	0008, 0237, 0277, 0477, 0877, 1877
Pacific Bell	0843
Panasonic	0107, 0021, 0144, 0008, 0124, 0307, 0000, 0040
Panther	0637
Paragon	0000, 0525, 0008
Penney	0637, 0000
Philips	0025, 0031, 0290, 0027, 0030, 0153, 0060, 0242, 0028, 0334, 0211, 0029, 0259, 0307, 0652, 0013, 0069, 0649, 0255, 0305, 0032, 0111, 0317
Pioneer	0144, 0023, 0533, 1877, 0877, 0260
Popular Mechanics	0400
Prelude	0770
Prism	0012, 0013, 0059
Protelcon	0786
Pulsar	0000, 0040

Additional Information

➡continued

Cable box brand	Code number
Quasar	0000
Quest	0144, 0020
R Line	0040
RadioShack	0883, 0015, 0315, 0303, 0797
Rampage	0255
Ranger	1247
RCA	0021, 0060, 0797, 0047, 1256, 0843
Realistic	0207, 0153
Recoton	0153, 0400
Regal	0259, 0020, 0273, 0279, 0276
Regency	0002, 0020, 0682
Rembrandt	0070, 0153, 0040, 0022, 0011
RK	0304, 0479
Runco	0000
Samsung	0040, 0144, 0023, 0003, 0070, 0000
Sasktel	1737
Scientific Atlanta	0008, 0277, 0017, 0006, 0237, 0025, 0477, 0207, 0877, 0003, 0012, 0000, 0021, 1877
Seam	0510
Sears	0510
Sejin	1265
Sigma	0019
Signal	0040, 0015, 0011, 0035
Signature	0011
SkyCable	0112
Skygiant	1091
SL Marx	0040
Sony	1006, 1506, 1606
Spectradyne	0769, 0058
Spectravision	0058
Sprucer	0021, 0307, 0010, 0144
Standard Components	0203, 0096, 0155
Starcom	0003, 0015, 0047, 0014, 0098, 0305

Cable box brand	Code number
Stargate	0015, 0040, 0770, 0865, 0797, 0305, 0014
Starquest	0015
StarSight	0542, 0422
Stealth	0274
Stellar One	0807
Storm	1018, 0637
Suena Madritel	1230
Supercable	0276
Supermax	0883
Sylvania	0001
Tandy	0258
Tatung	0097
Teac	1018
Technics	0029
Teknika	0146
Teleavia	0040
TeleCaption	0221
Teleview	0063, 0040
Texscan	0001, 0096, 0010
TFC	0310
Thomson	1256
Timeless	0418, 0274, 0040
Tocom	0012, 0013, 0029, 0019, 0059, 0017
Torx	0003
Toshiba	0000
Trans PX	0303, 0276, 0153, 0315
Trinity	1248
Tristar	0883
TS	0255, 0024, 1018, 0003, 0303
Tusa	0015
TV COMM	0035, 0019
TV Guide	1476
TV86	0063, 0040
Uniden	0022
Unika	0207, 0153, 0022

Cable box brand	Code number
United Cable	0003, 0014, 0011, 0276
Universal	0191, 0078, 0207, 0056, 0022, 0039, 0153, 0077, 0322, 0315
US Electronics	0276, 0008, 0003, 0017
V2	0883
Videoway	0250, 0000
VideoWorks	0124
Vidtech	0244
Viewmaster	0883, 0770
Viewstar	0258, 0289, 0060, 0063, 0211, 0027, 0111, 0030, 0121
Vision	0883
Visionetics	1264
Vortex View	0883
WaveMaster	0565
Wiso	0078
Zenith	0000, 0525, 0054, 0017, 0039, 0153, 0060, 0315, 0191, 0899
Zentek	0400

Satellite receiver brand	Code number
AlphaStar	0772
Atlantic Telephone	1333
Bell ExpressVu	0775
Century	0856
Chaparral	0216
Crossdigital	1109
DirecTV	0749, 0566, 0392, 1749, 0099, 1109, 1076, 1442, 1856, 0247, 1142, 1639, 0724, 0639, 0819
Dish Network System	0775, 1005, 1170
Dishpro	0775, 1005
Echostar	0775, 1170, 1005
Expressvu	0775
Galaxis	0863
GE	0566
General Instrument	0361, 0869, 0627
GOI	0775
Gradiente	0856
Hitachi	0819, 0749
Houston Tracker	0775
HTS	0775
Hughes Network Systems	0749, 1749, 1442, 1142
Humax	1176, 1359, 1048, 0863, 0283
Innova	0099
Jerrold	0361, 0036, 0627
JVC	0775, 1170
Magnavox	0722, 0724
McIntosh	0869
Memorex	0724
Mitsubishi	0749
Motorola	0869
NEC	1270
Netsat	0099
Next Level	0869
Optimus	0724
Panasonic	0247, 0701

Additional Information

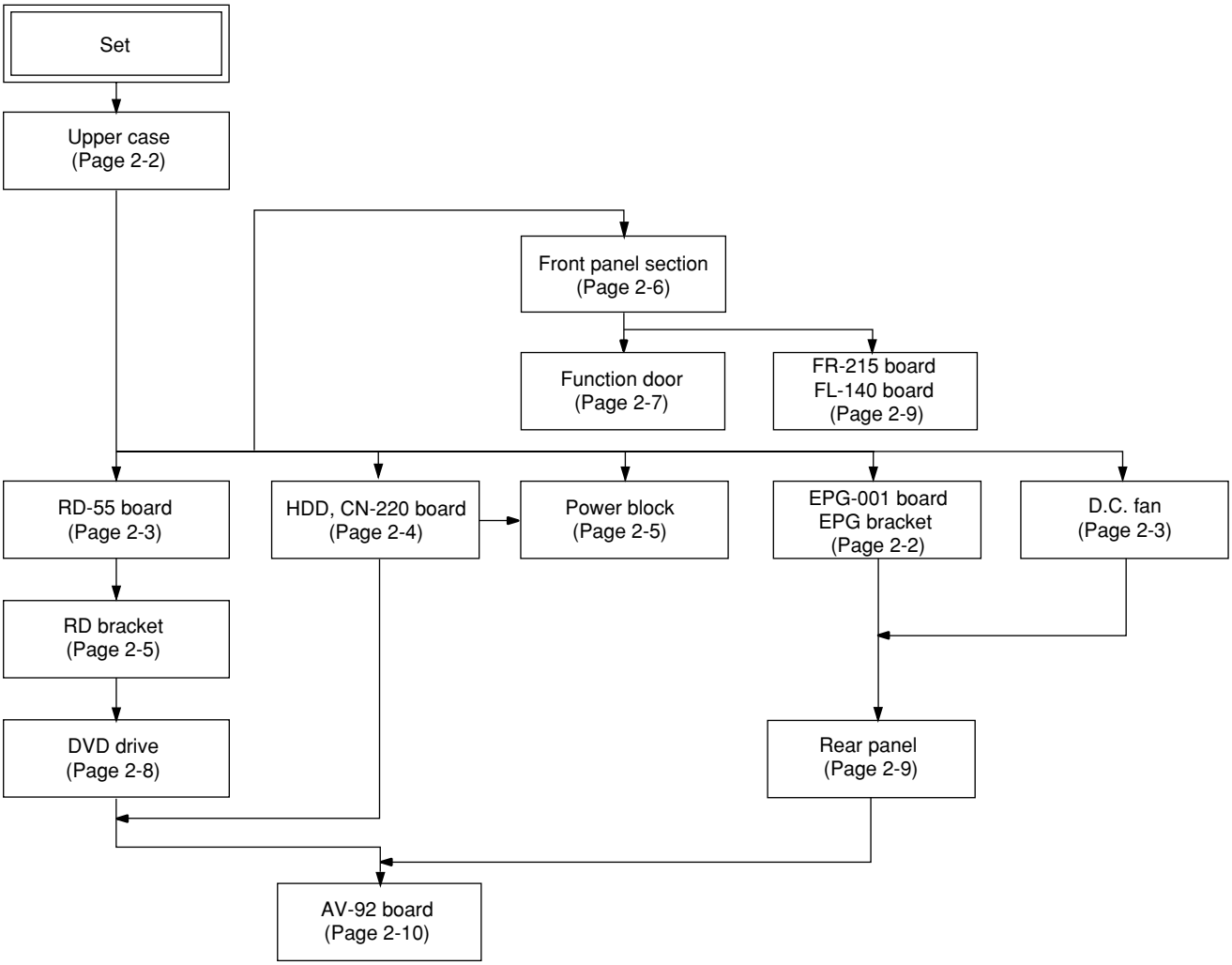
➡continued

Satellite receiver brand	Code number
Paysat	0724
Philips	1076, 0099, 1142, 0724, 0722, 0749, 1442, 1749, 0856, 0775
Primestar	0361, 0627, 0869
Proscan	0392, 0566
QNS	1367
RadioShack	0869
RCA	0566, 0392, 0143, 0855
Samsung	1109, 1276
Sky	0856, 0099, 1856
Sony	0639, 1639
Star Choice	0869
Star Trak	0869, 0772
Thomson	0566, 0392
Tivo	1142, 1442
Toshiba	0790, 0749, 1749, 1285
UEC	1333, 1358
Uniden	0724, 0722
Video Cipher II Plus	0361
Zenith	0856, 1856

MEMO

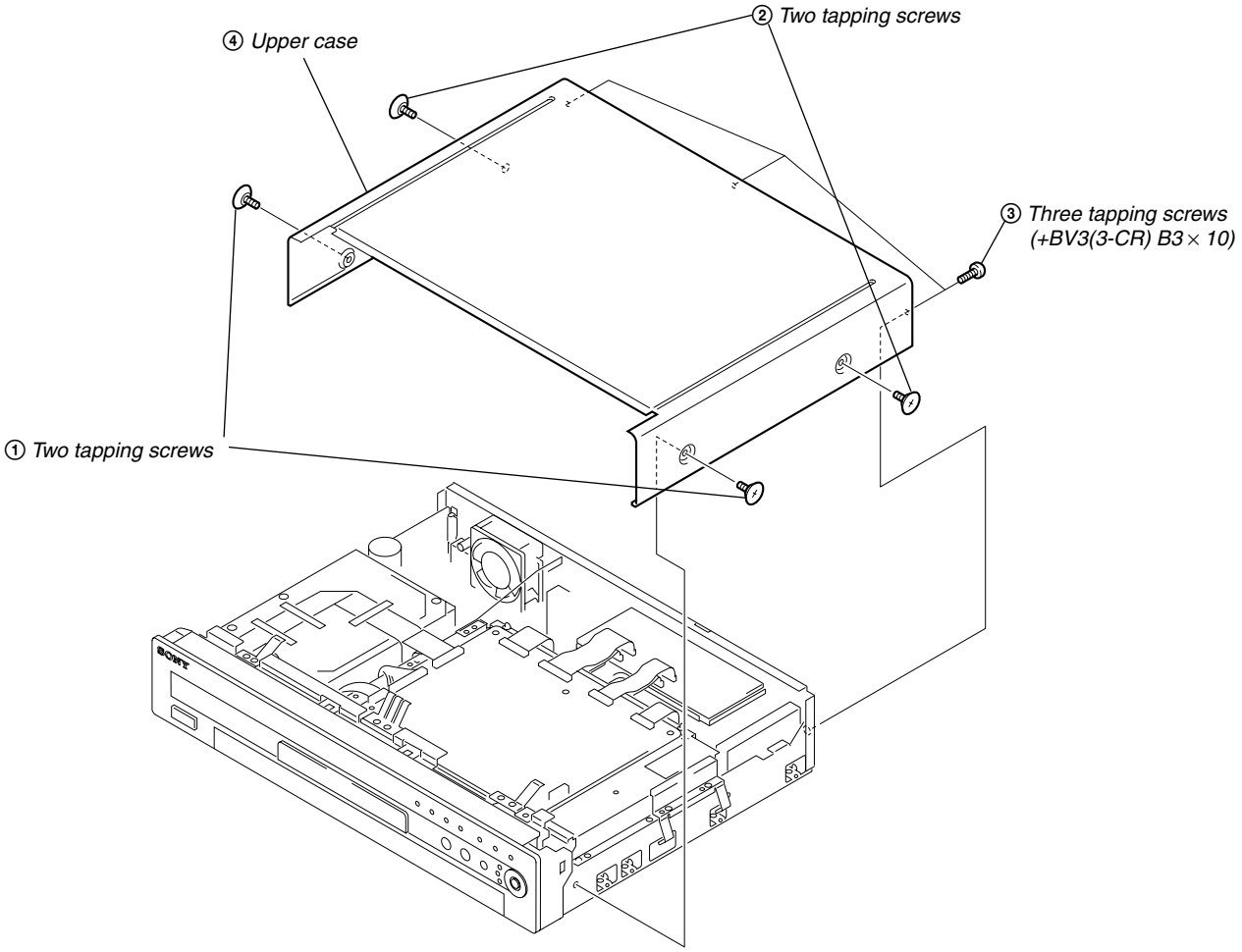
SECTION 2
DISASSEMBLY

NOTE: The following flow chart shows the disassembly procedure.

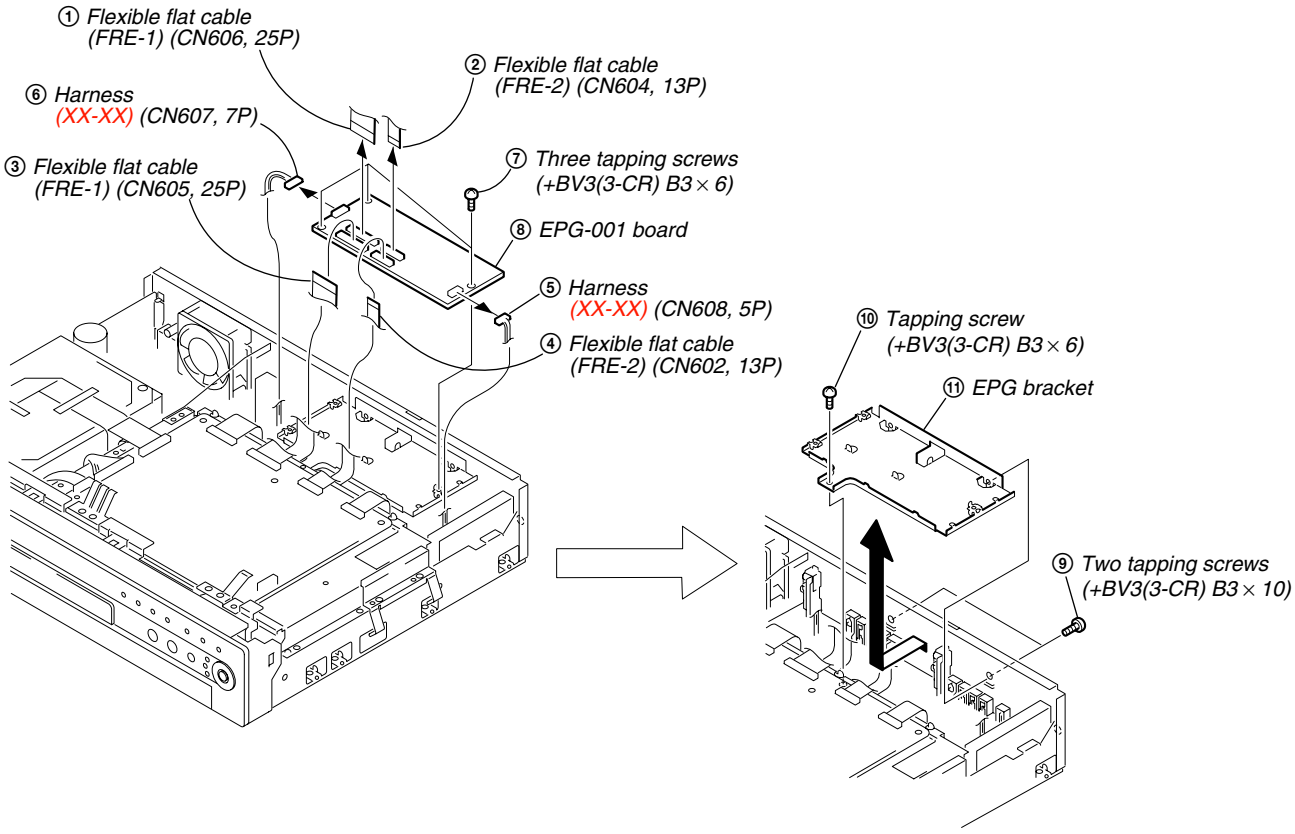


NOTE: Follow the disassembly procedure in the numerical order given.

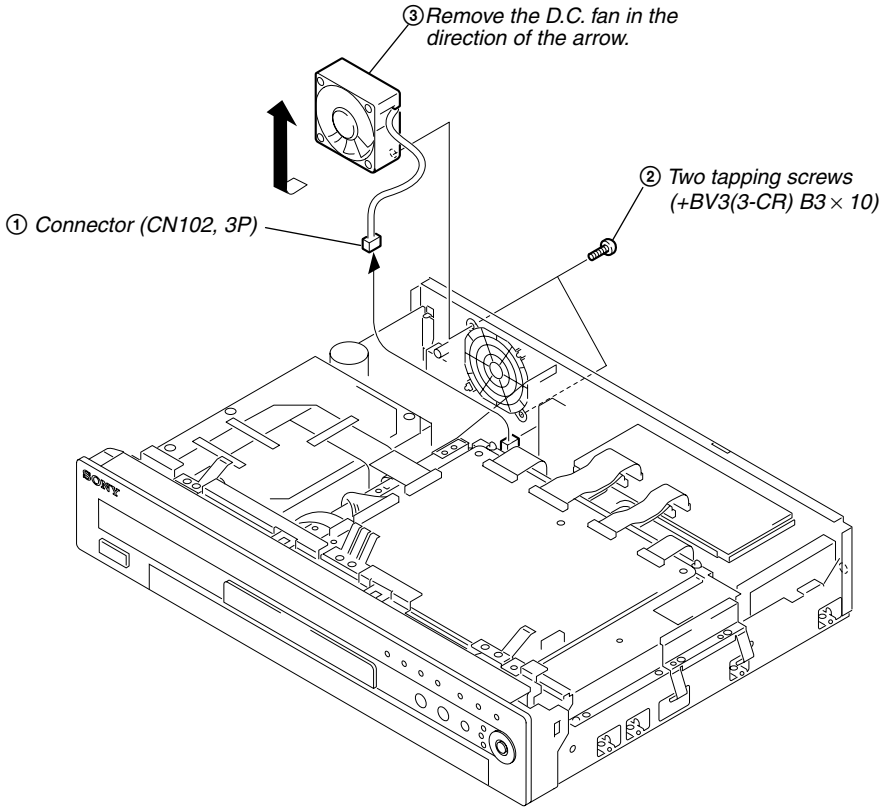
2-1. UPPER CASE



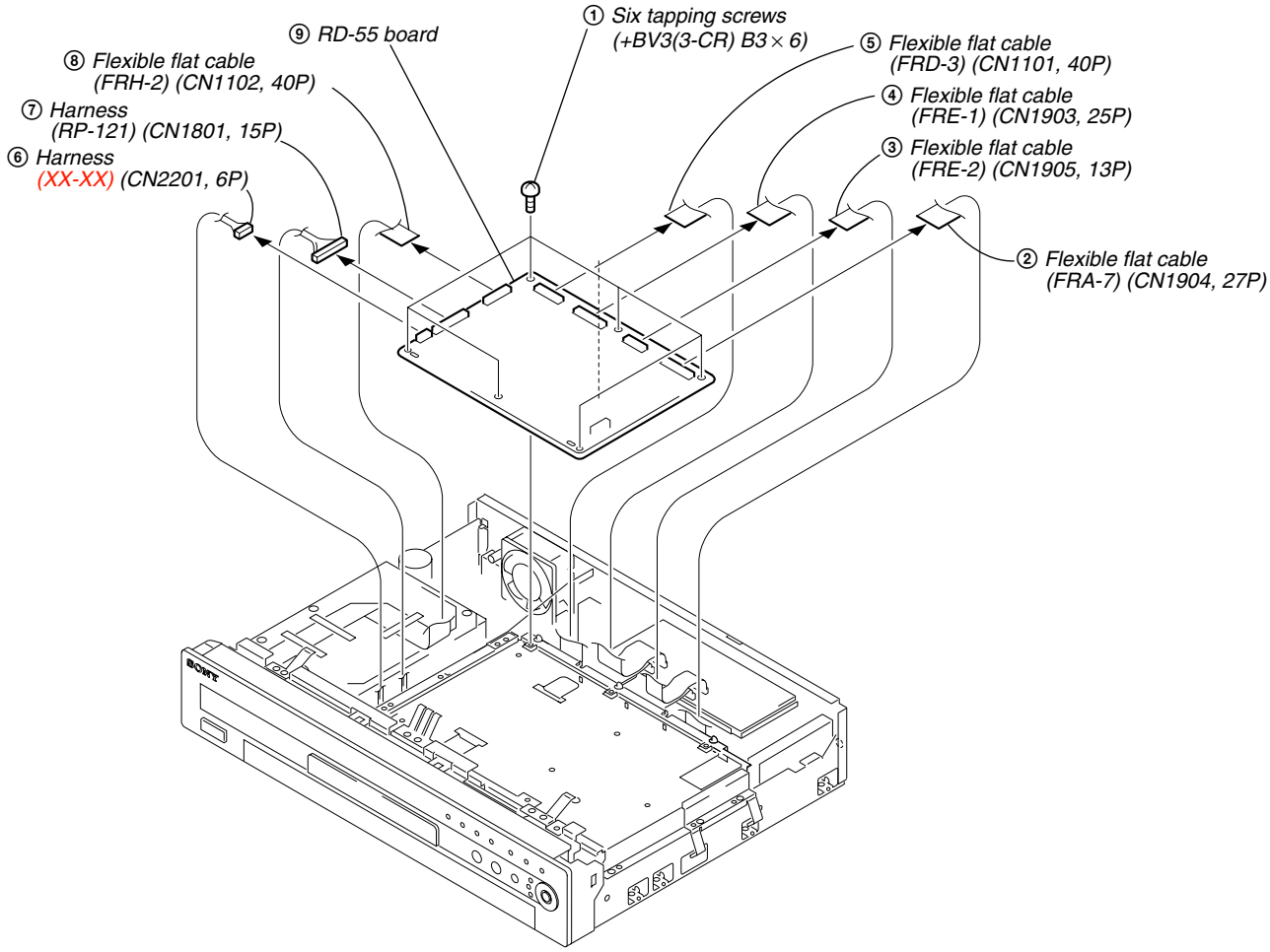
2-2. EPG-001 BOARD, EPG BRACKET



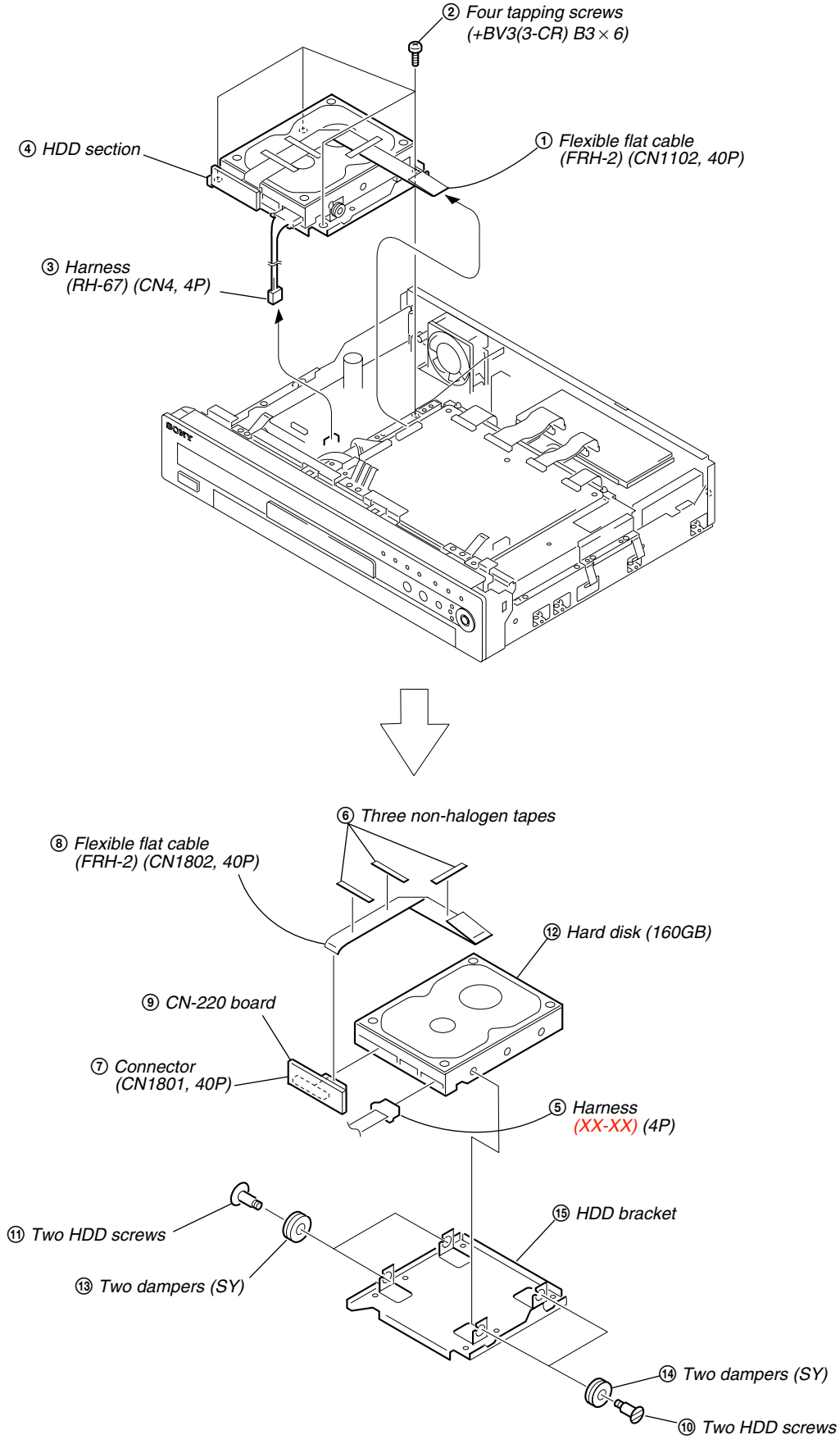
2-3. D.C. FAN



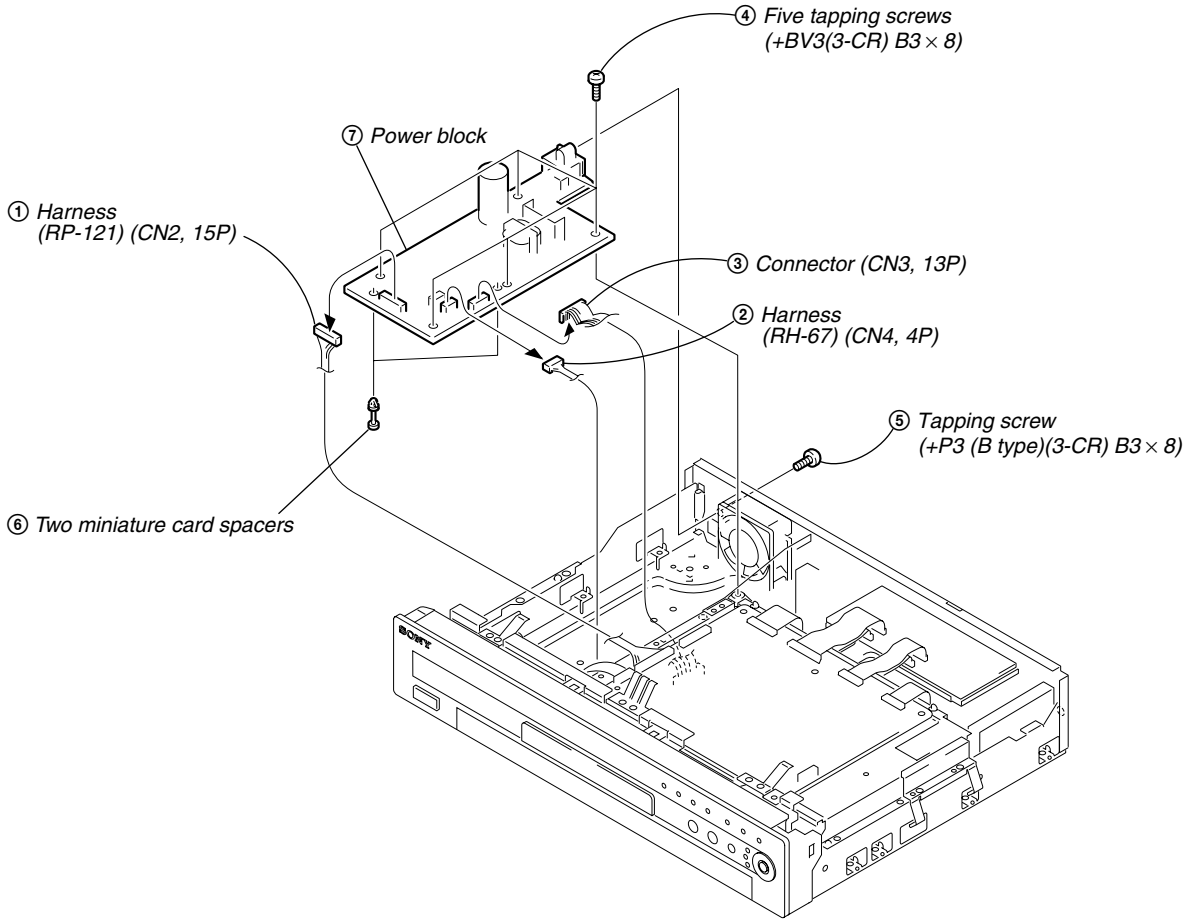
2-4. RD-55 BOARD


① Six tapping screws (+BV3(3-CR) B3 × 6)
⑨ RD-55 board
⑧ Flexible flat cable (FRH-2) (CN1102, 40P)
⑦ Harness (RP-121) (CN1801, 15P)
⑥ Harness (XX-XX) (CN2201, 6P)
⑤ Flexible flat cable (FRD-3) (CN1101, 40P)
④ Flexible flat cable (FRE-1) (CN1903, 25P)
③ Flexible flat cable (FRE-2) (CN1905, 13P)
② Flexible flat cable (FRA-7) (CN1904, 27P)

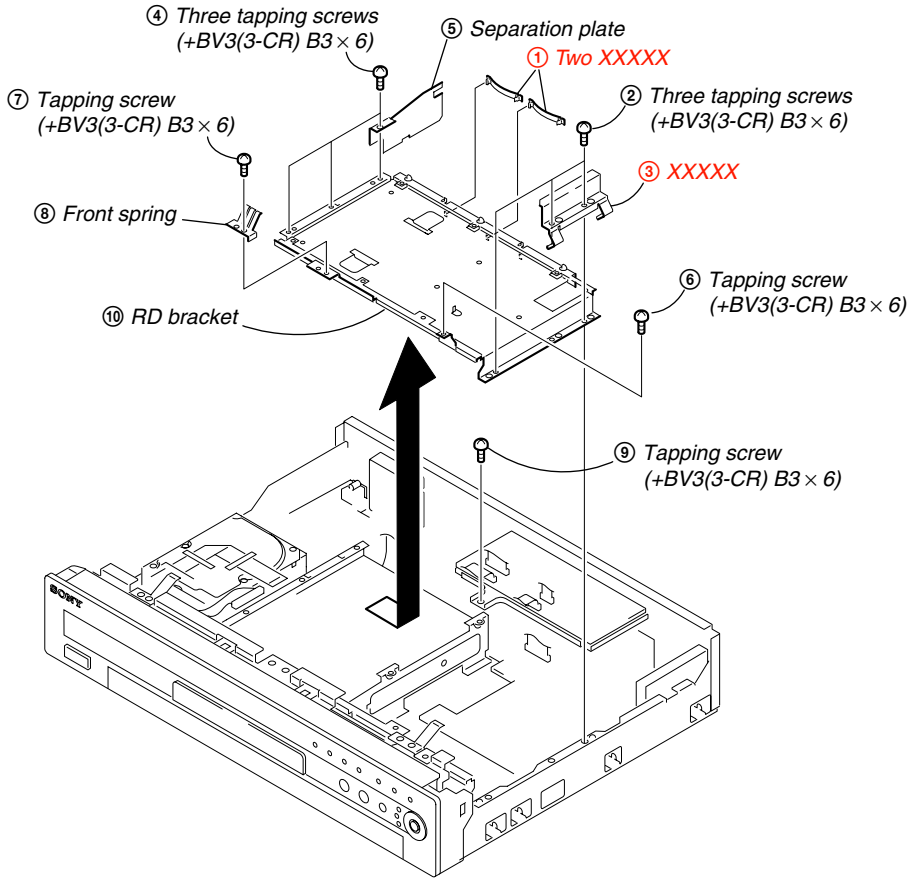
2-5. HDD, CN-220 BOARD



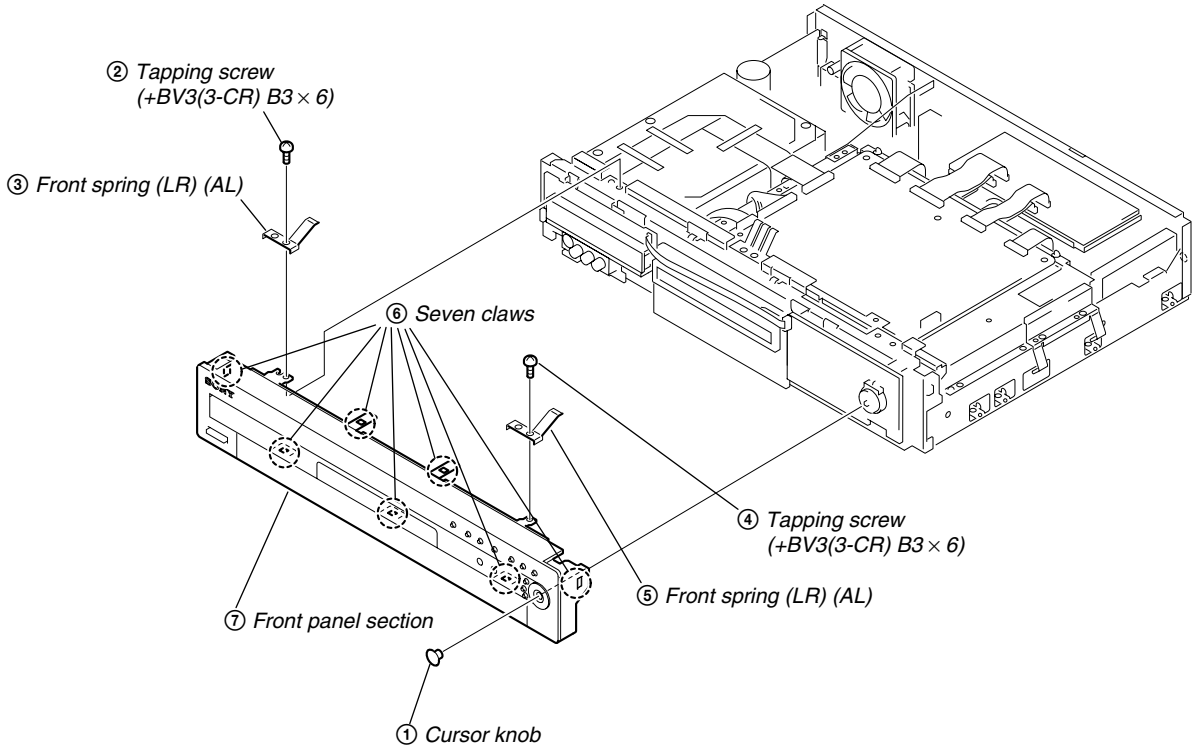
2-6. POWER BLOCK



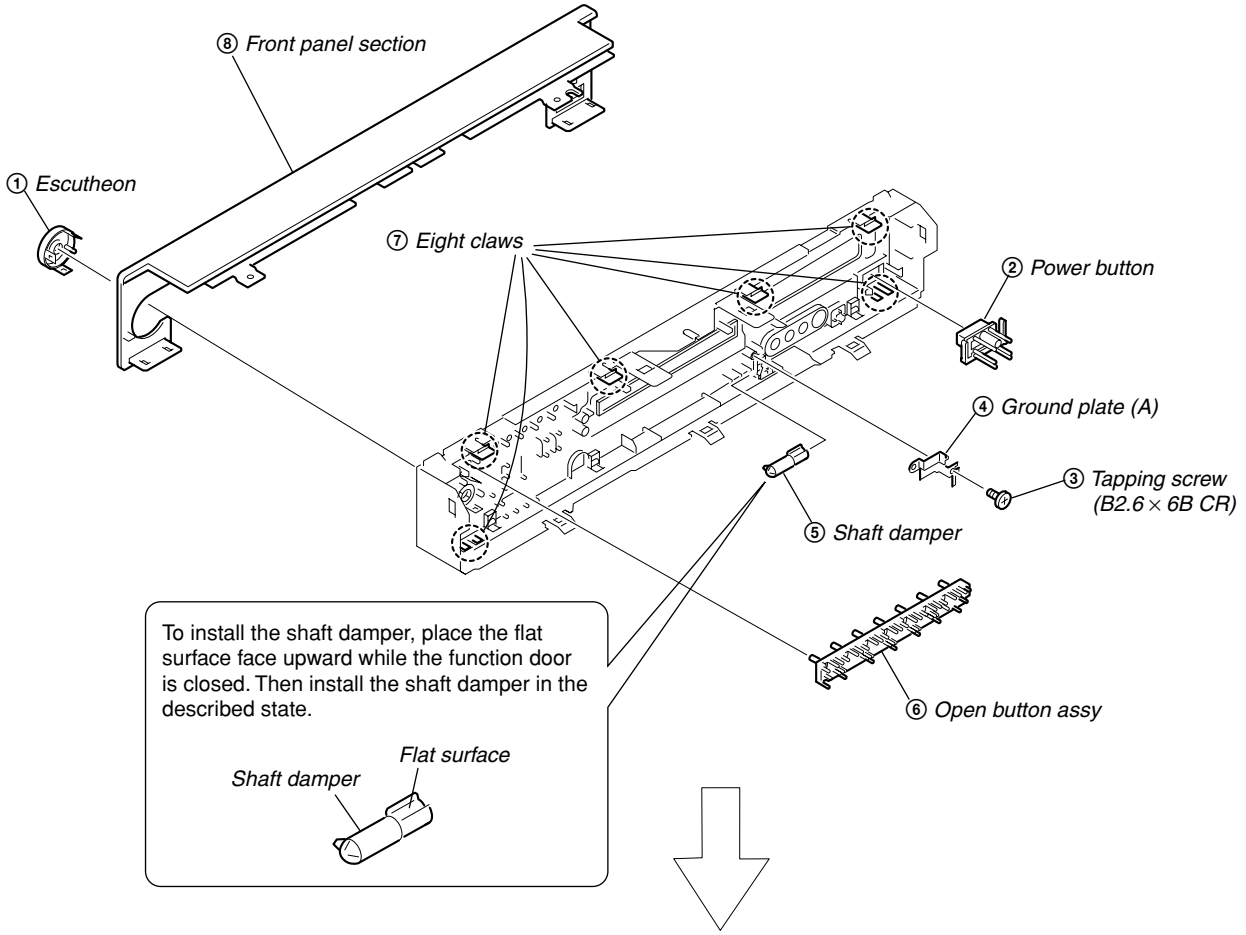
2-7. RD BRACKET

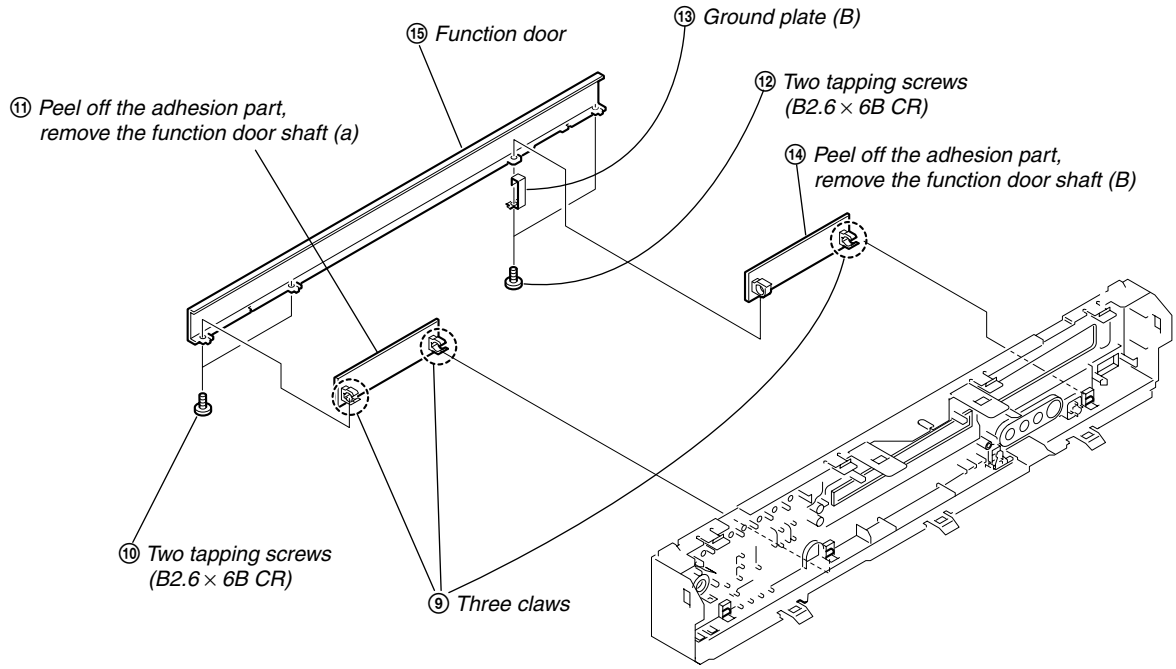


2-8. FRONT PANEL SECTION

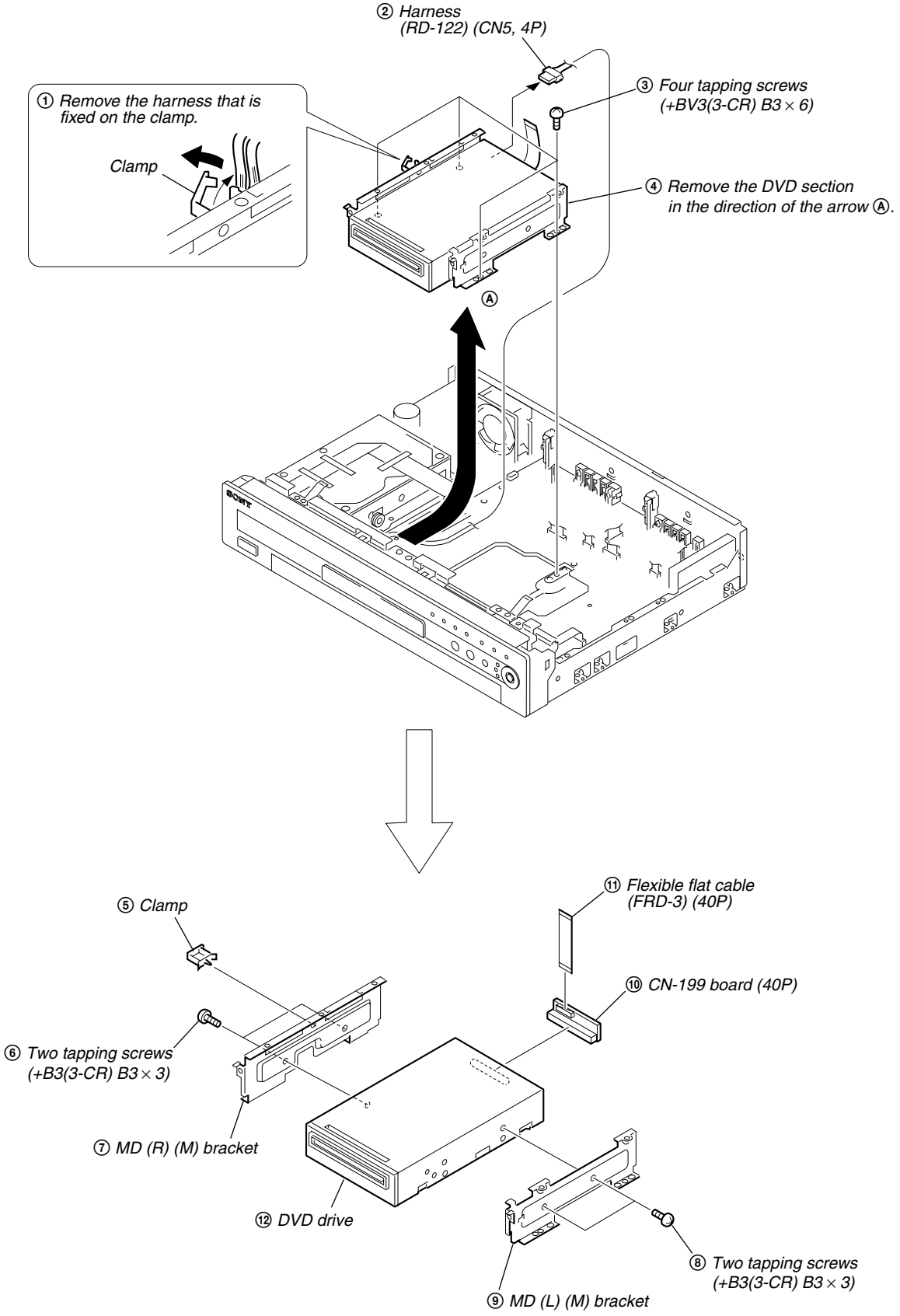


2-9. FUNCTION DOOR

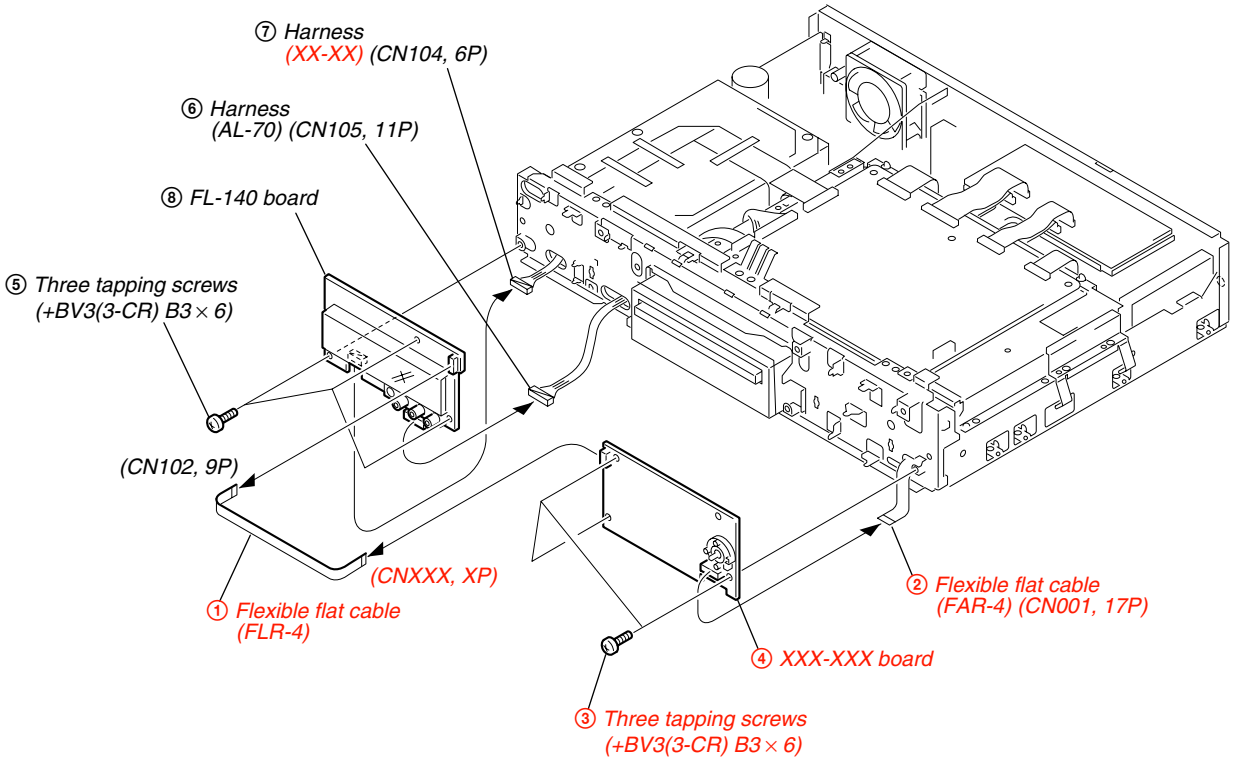

⑧ Front panel section
① Escutheon
⑦ Eight claws
② Power button
④ Ground plate (A)
③ Tapping screw (B2.6 × 6B CR)
⑤ Shaft damper
⑥ Open button assy
To install the shaft damper, place the flat surface face upward while the function door is closed. Then install the shaft damper in the described state.
Flat surface
Shaft damper


⑮ Function door
⑬ Ground plate (B)
⑫ Two tapping screws (B2.6 × 6B CR)
⑪ Peel off the adhesion part, remove the function door shaft (a)
⑭ Peel off the adhesion part, remove the function door shaft (B)
⑩ Two tapping screws (B2.6 × 6B CR)
⑨ Three claws

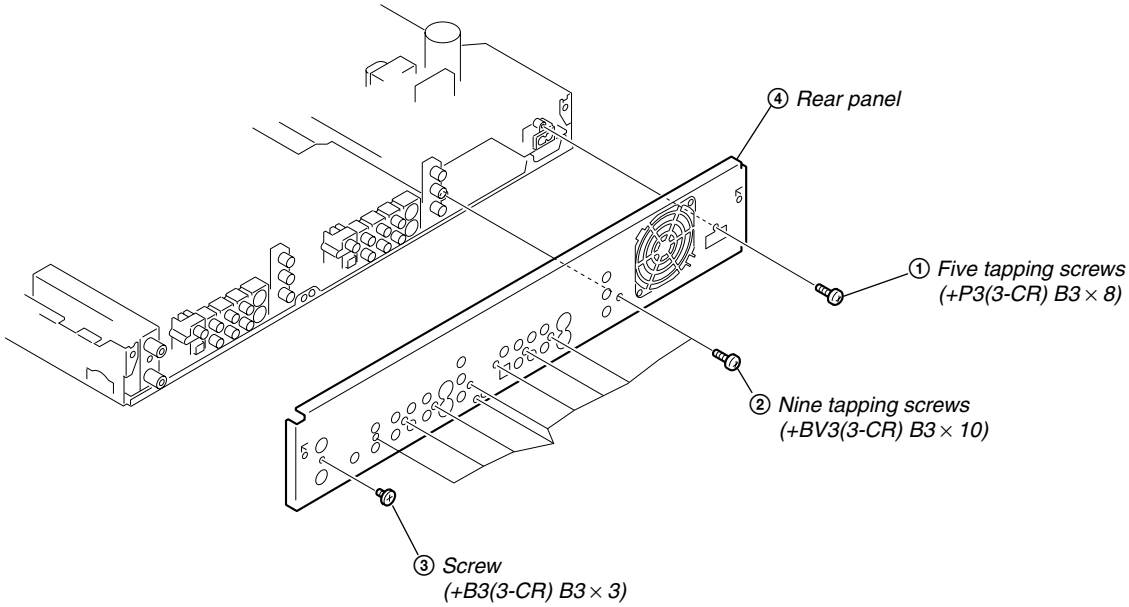
2-10. DVD DRIVE



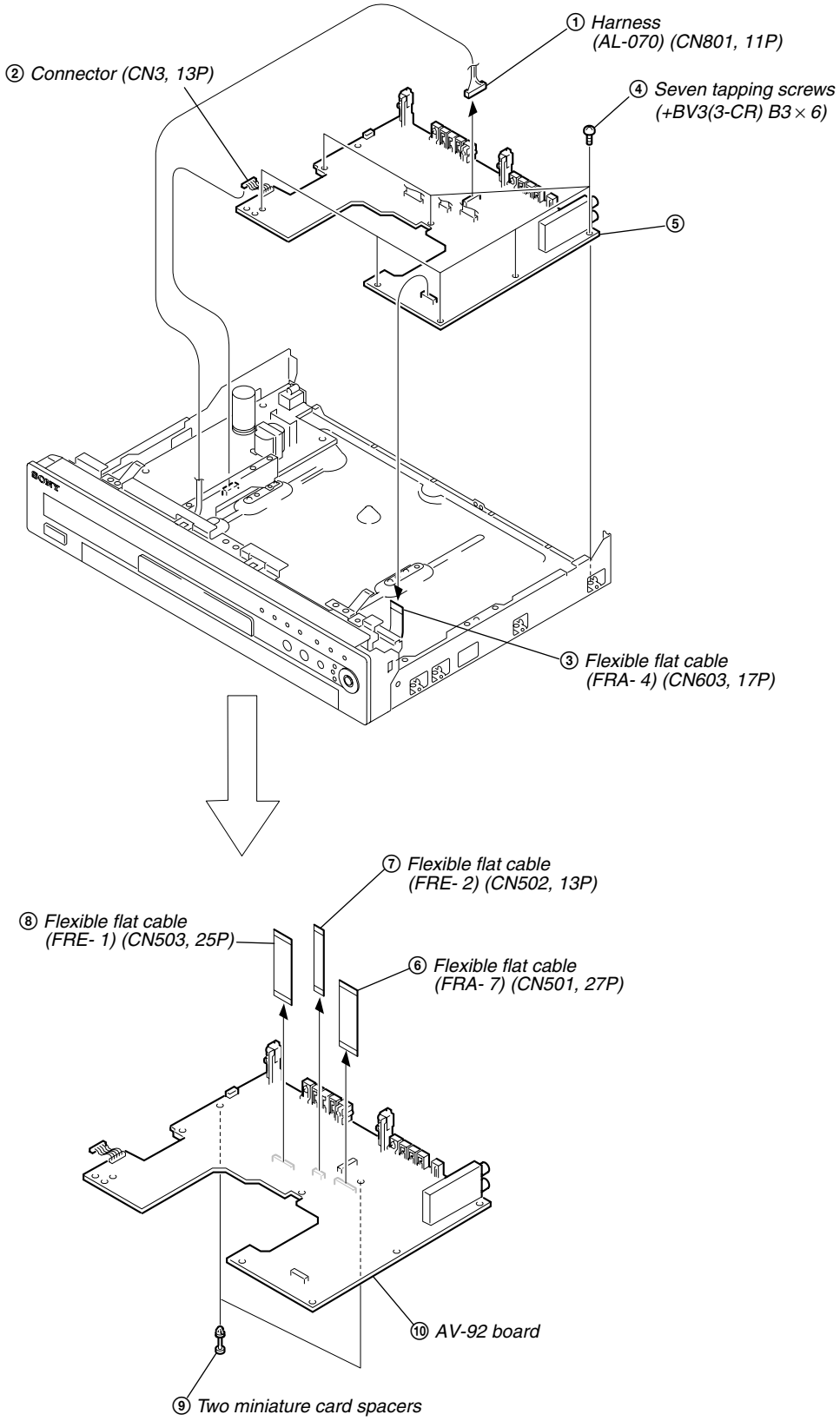
2-11. FR-215 BOARD, FL-140 BOARD



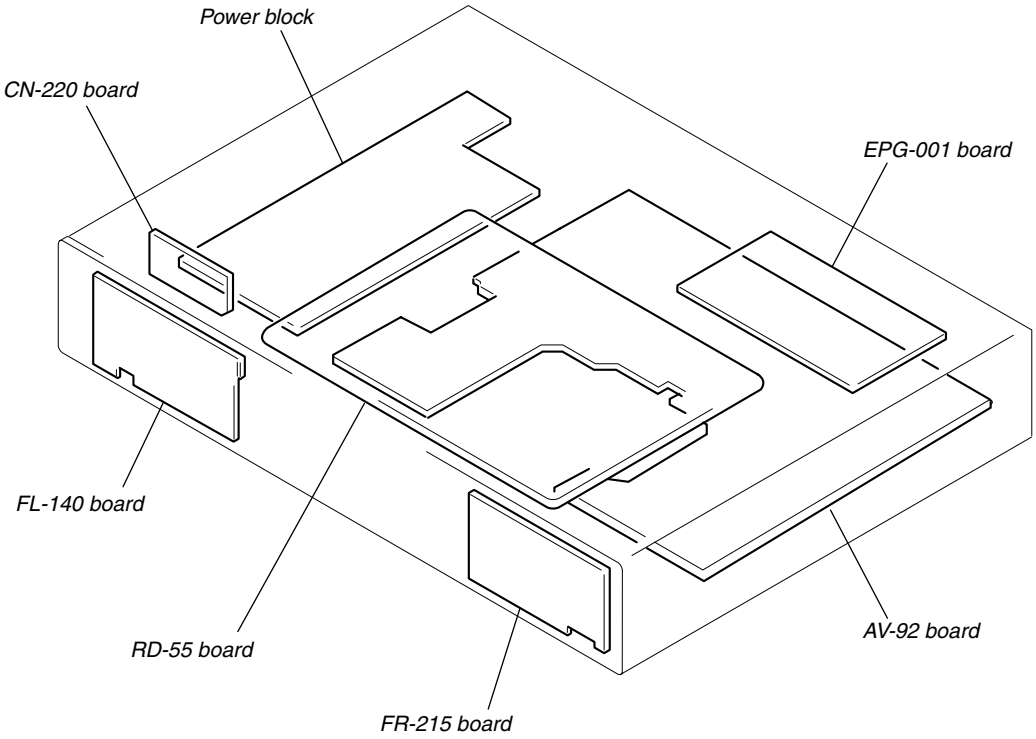
2-12. REAR PANEL



2-13. AV-92 BOARD



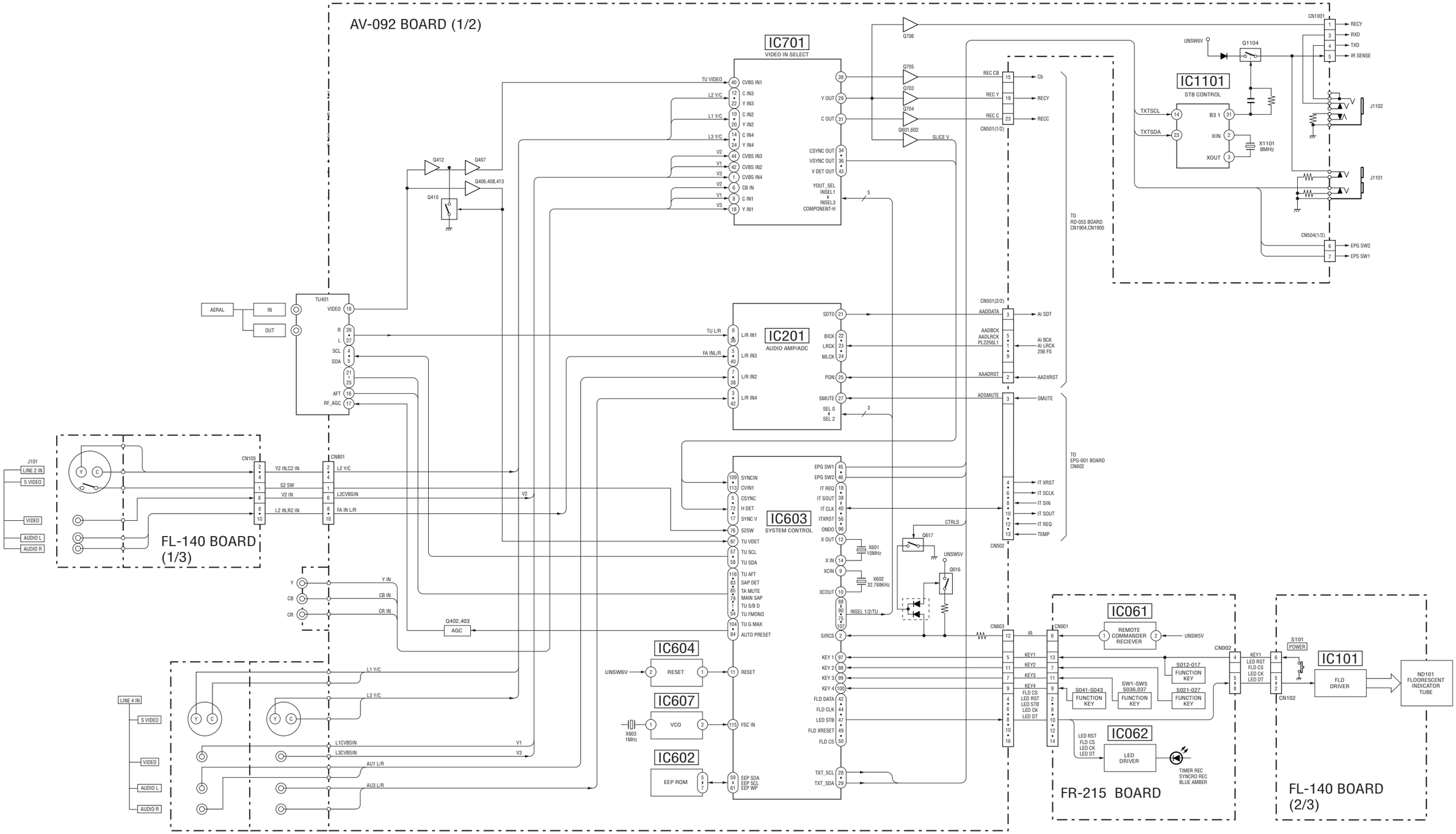
2-14. CIRCUIT BOARDS LOCATION



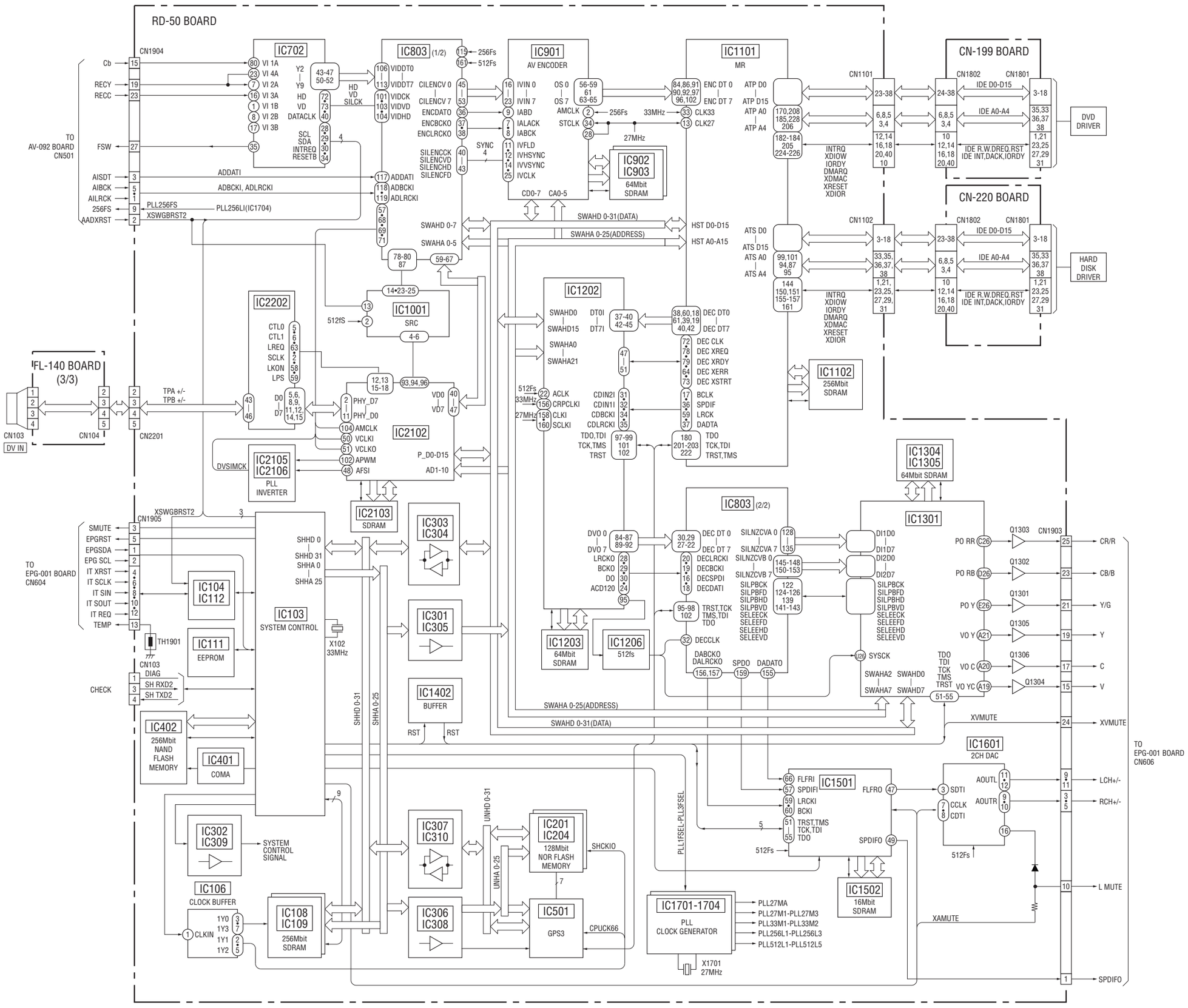
MEMO

SECTION 3
BLOCK DIAGRAMS

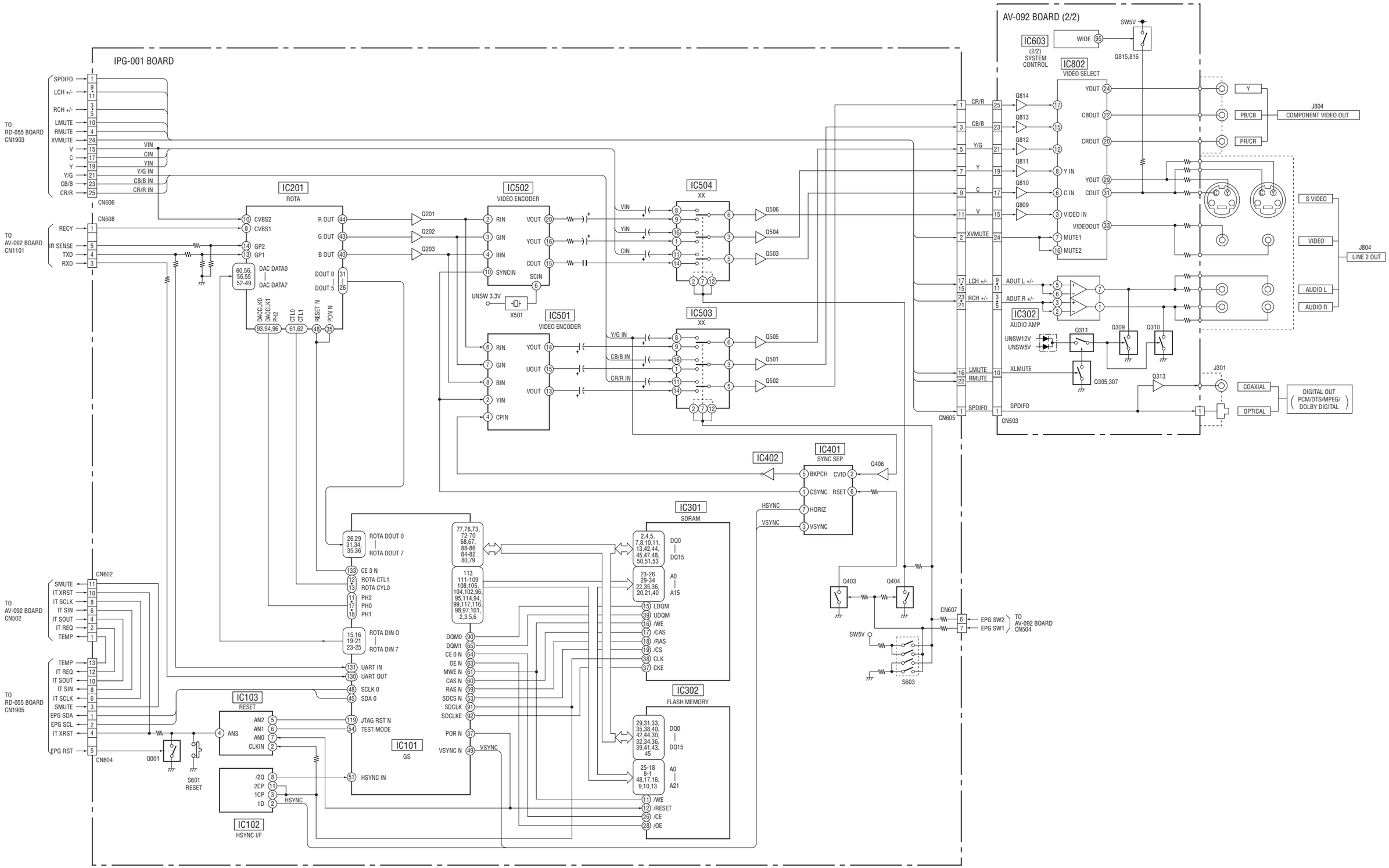
3-1. OVERALL BLOCK DIAGRAM (1/3)



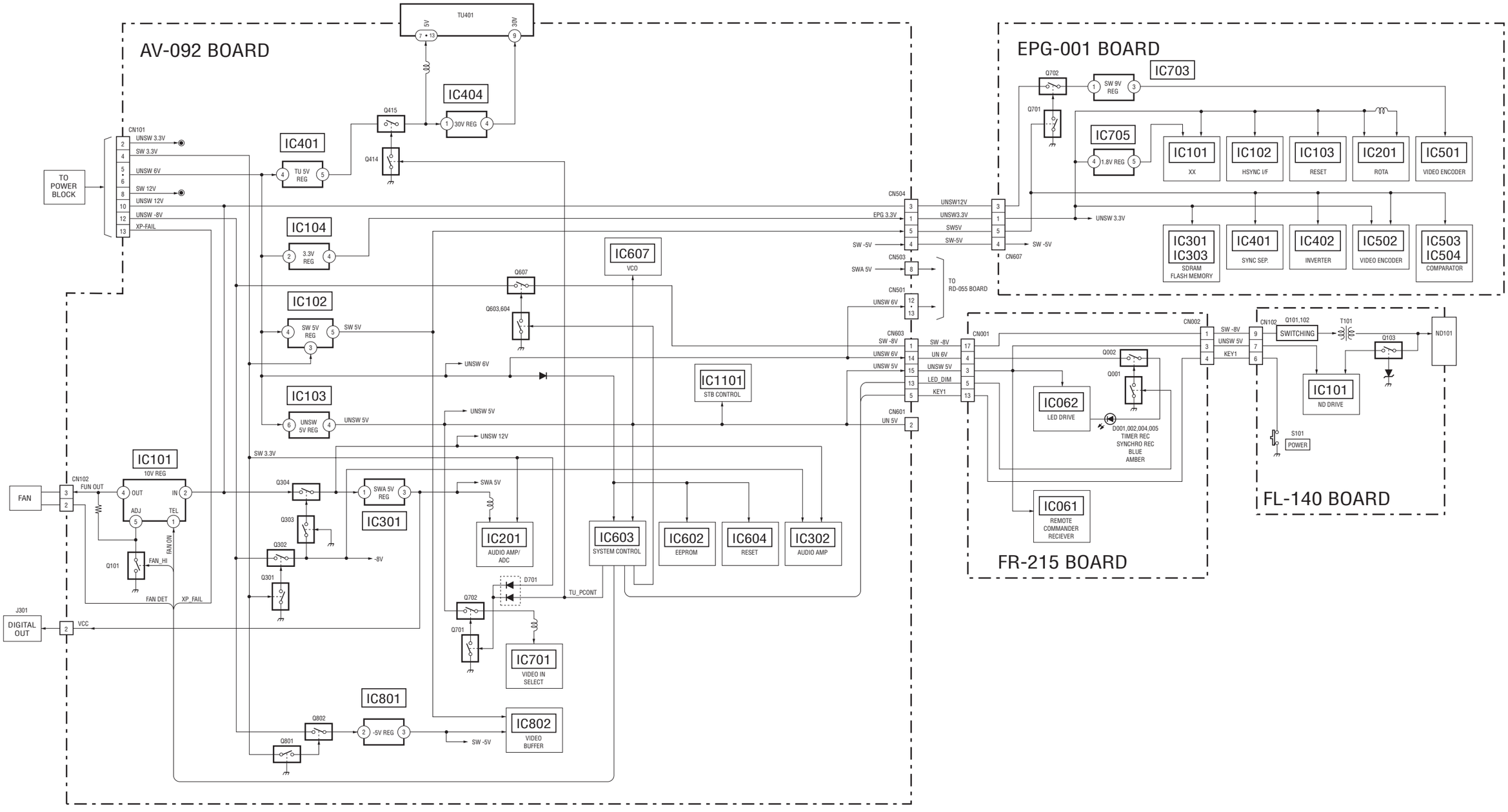
3-2. OVERALL BLOCK DIAGRAM (2/3)



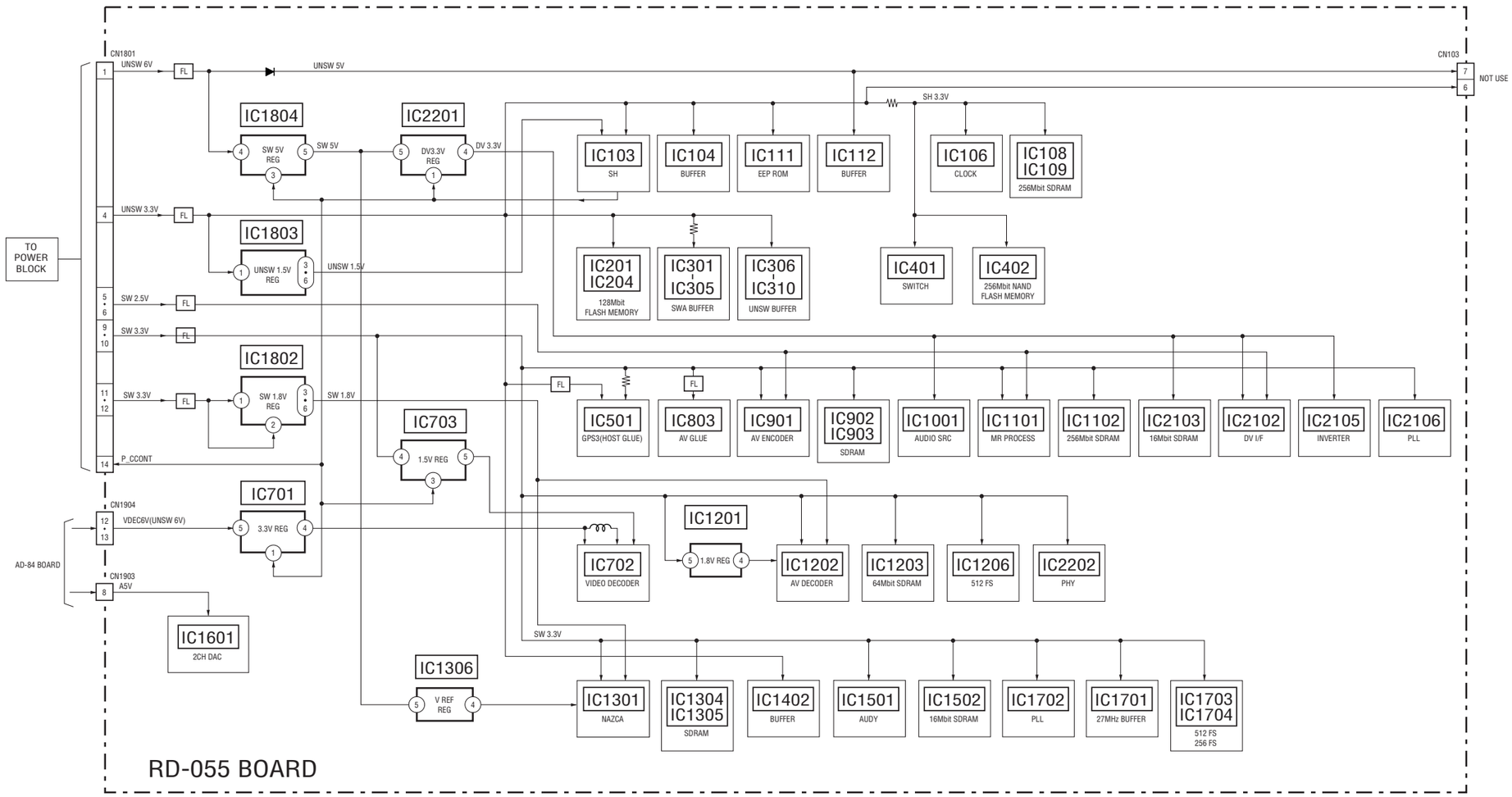
3-3. OVERALL BLOCK DIAGRAM (3/3)



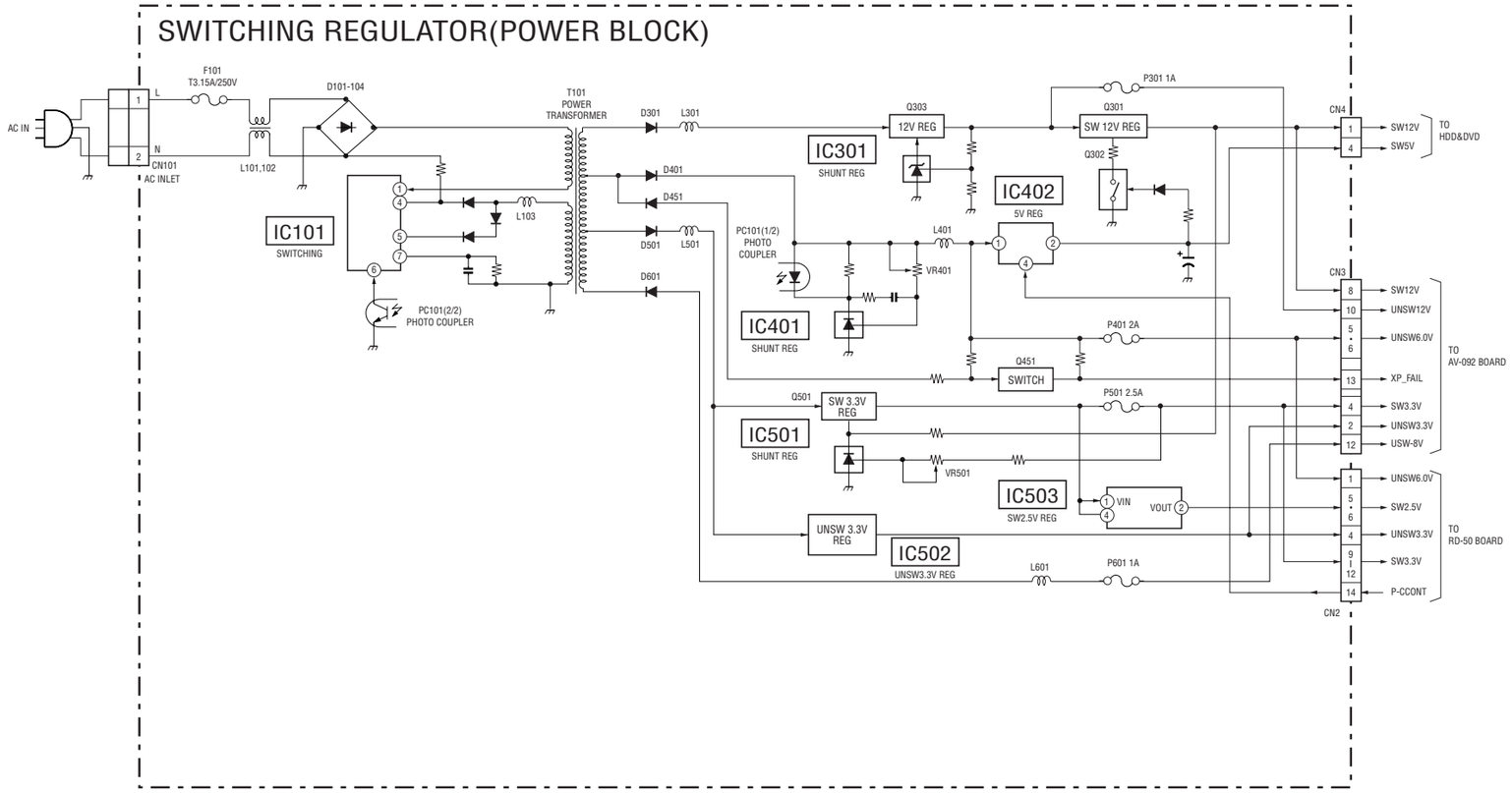
3-4. POWER BLOCK DIAGRAM (1/3)



3-5. POWER BLOCK DIAGRAM (2/3)

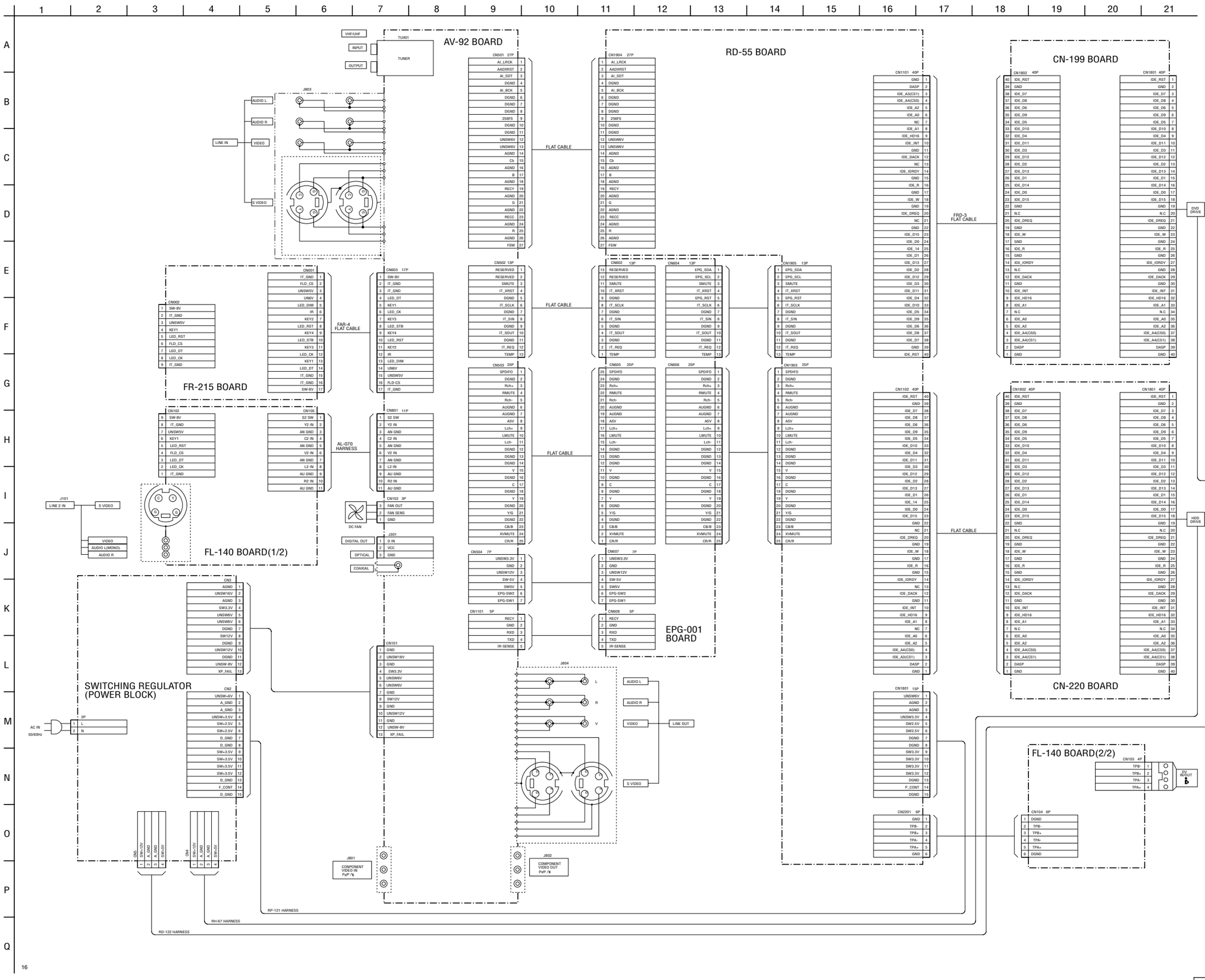


3-6. POWER BLOCK DIAGRAM (3/3)



SECTION 4
SCHEMATIC DIAGRAMS

4-1. FRAME SCHEMATIC DIAGRAM



4-2. SCHEMATIC DIAGRAMS

THIS NOTE IS COMMON FOR SCHEMATIC DIAGRAMS
(In addition to this, the necessary note is printed in each block)

(For schematic diagrams)

- All capacitors are in μF unless otherwise noted. pF : μμF. 50V or less are not indicated except for electrolytics and tantalums.
- All resistors are in ohms, 1/4 W (Chip resistors : 1 /10 W) un-less otherwise specified.
  kΩ=1000Ω, MΩ=1000kΩ.
- Caution when replacing chip parts.
  New parts must be attached after removal of chip.
  Be careful not to heat the minus side of tantalum capacitor, because it is damaged by the heat.
- All variable and adjustable resistors have characteristic curve B, unless otherwise noted.
- : non flammable resistor
- : fusible resistor
- : panel designation
- △ : internal component.
- : adjustment for repair.
- B + : B+ Line
- B − : B– Line
- Circled numbers refer to waveforms.
- Voltages are dc between measurement point.
- Readings are taken with a color-bar signals on DVD reference disc.
- Readings are taken with a digital multimeter (DC 10MW).
- Voltage variations may be noted due to normal production tolerances.

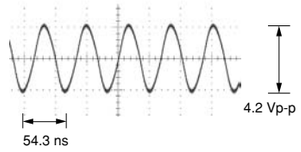
Note : The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

When indicating parts by reference number, please include the board name.

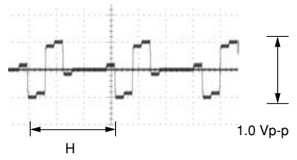
WAVEFORMS

AV-92 BOARD

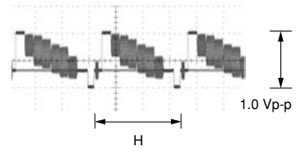
① IC405 ⑥



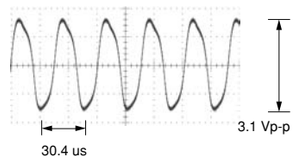
⑥ IC802 ⑳



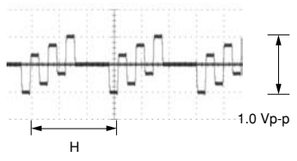
⑪ IC802 ㉝



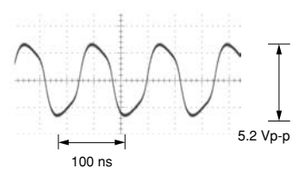
② IC603 ⑩



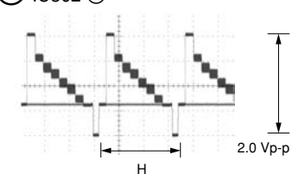
⑦ IC802 ㉒



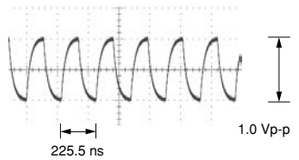
③ IC603 ⑫



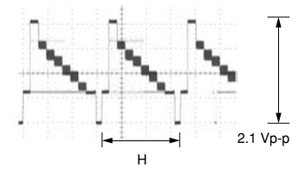
⑧ IC802 ㉔



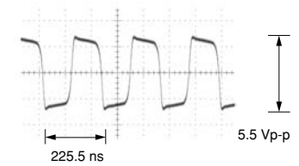
④ IC603 ⑮



⑨ IC802 ㉙



⑤ IC607 ⑦



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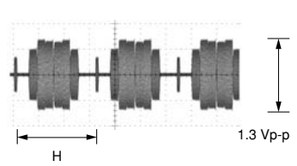
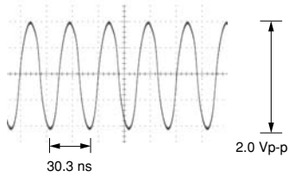
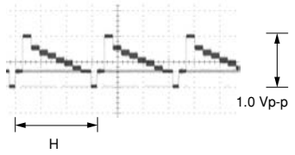


RD-55 BOARD

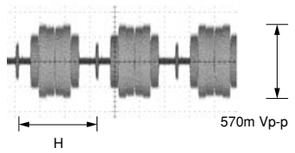
① IC103 Ⓐ2 (JL127)



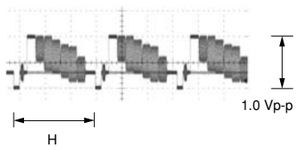
② IC702 ⑦ (S-VIDEO)



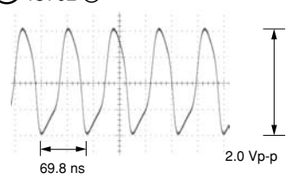
③ IC702 ⑯ (S-VIDEO)



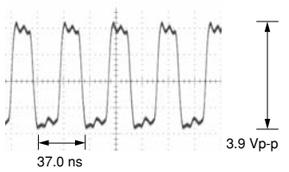
④ IC702 ㉓ (VIDEO)



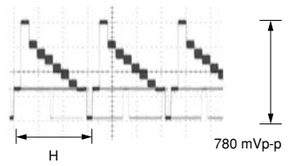
⑤ IC702 ㉕



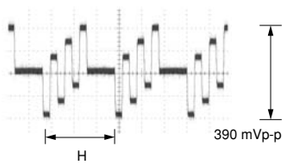
⑥ IC1202 ㊺



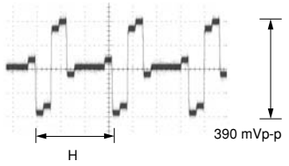
⑦ Q1301 Ⓔ



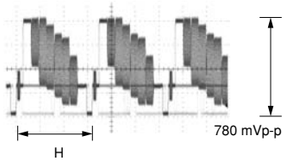
⑧ Q1302 Ⓔ



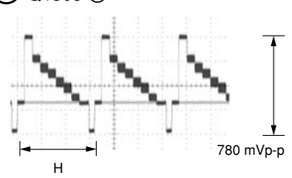
⑨ Q1303 Ⓔ



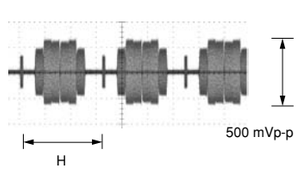
⑩ Q1304 Ⓔ



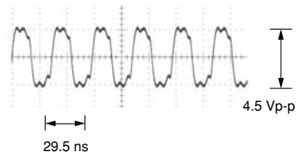
⑪ Q1305 Ⓔ



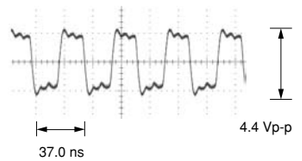
⑫ Q1306 Ⓔ



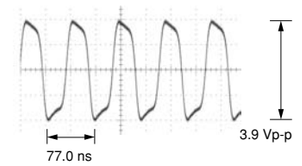
⑬ IC1702 ③④



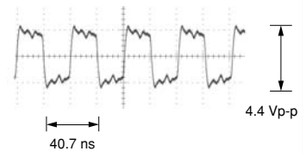
⑭ IC1702 ⑦⑧



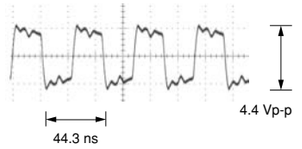
⑮ IC1702 ⑫



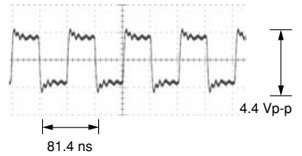
⑯ IC1702 ⑮



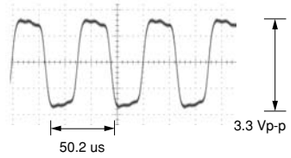
⑰ IC1702 ⑱



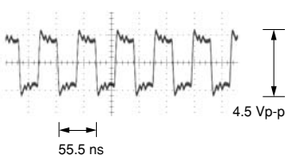
⑱ IC1702 ⑳



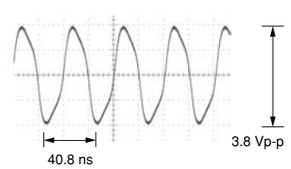
⑲ IC2105 ② (JL2127)



⑳ IC2106 ⑩



㉑ IC2202 ㉑



AV-92 BOARD(1/8)

POWER

-REF.NO.:10000 SERIES-

NO MARK:REC/PB MODE

TO SWITCHING REGULATOR CN3 (SEE PAGE 4-88)

CN101 13P

GND	1	JL101
UNSW3.3V	2	JL102
GND	3	JL103
SW3.3V	4	JL104
UNSW6V	5	
UNSW6V	6	
GND	7	JL105
SW12V	8	JL117
GND	9	JL106
UNSW12V	10	
GND	11	JL107
UNSW-8V	12	JL108
XP_FAIL	13	

XP_FAIL
FAN_ON
FAN_HI
FAN_DET
1 TO(5/8)

CN102 3P

FAN OUT	3	JL115
FAN SENS	2	JL116
GND	1	

DC FAN

R118 10k

IC101
9V REG
IC101 SI-3010KM-TL
6 GND
1 CTL 4.8
2 IN 12.2
3 GND
4 OUT 7.4
5 ADJ 1.0

Q101 MUN2213T1 SWITCH
0 0.4

R109 100k ±0.5%
R110 10k
C105 0.1u B 16V
R111 5600 ±0.5%
C112 0.01u B 25V
C113 47u 16V

IC102
5V REG
IC102 PQ1MX55M2SPQ
4 VIN 5.8
5 VOUT 5.1
3 CONT 3.3
2 GND
1 ADJ 1.2

R137 330k ±0.5%
R139 47k ±0.5%
R138 120k ±0.5%
C103 0.1u B
C108 1u B

IC104
3.3V REG
IC104 SI-3010KM-TL
6 GND
1 TL 5.8
2 IN 5.8
3 GND
4 OUT 3.4
5 ADJ 1.0

R122 1200
R123 22k ±5%
R124 10k ±5%
C110 47u 16v
C109 0.01u B

IC103
5V REG
IC103 TK11250CMCL-G
6 VIN 5.8
5 GND
4 VOUT 5.0
1 CONT
2 GND
3 NP 1.3

C104 0.1u B 16V
C116 0.01u B 25V
C117 1u B 16V

JL110
JL111
JL112
JL113
JL114

R105 0
R106 0
R107 0
R108 0

B+ SW3.3V
B+ UNSW6V
VIN_GND
2 TO(2/8)

B+ SW3.3V
B+ UNSW12V
B- UNSW-8V
B+ UNSW5V
GND
VOUT_GND
3 TO(3/8)

B+ UNSW6V
TU_GND
IT_GND
4 TO(4/8)

B- UNSW-8V
B+ UNSW6V
B+ UNSW5V
IT_GND
5 TO(5/8)

B+ SW3.3V
B+ UNSW5V
VIN_GND
6 TO(6/8)

B+ SW3.3V
B+ SW5V
B- UNSW-8V
VOUT_GND
TU_GND
VIN_GND
B- SW-5V
7 TO(7/8)

B+ UNSW6V
B+ UNSW5V
IT_GND
TU_GND
25 TO(8/8)

CN504 7P

1	UNSW3.3V
2	GND
3	UNSW12V
4	SW-5V
5	SW5V
6	EPG_SW2
7	EPG_SW1

TO EPG-001 BOARD(1/6) CN607 (SEE PAGE 4-28)

24 TO(5/8)
EPG_SW2 JL538
EPG_SW1 JL539 JL540

AV-92 BOARD(2/8)

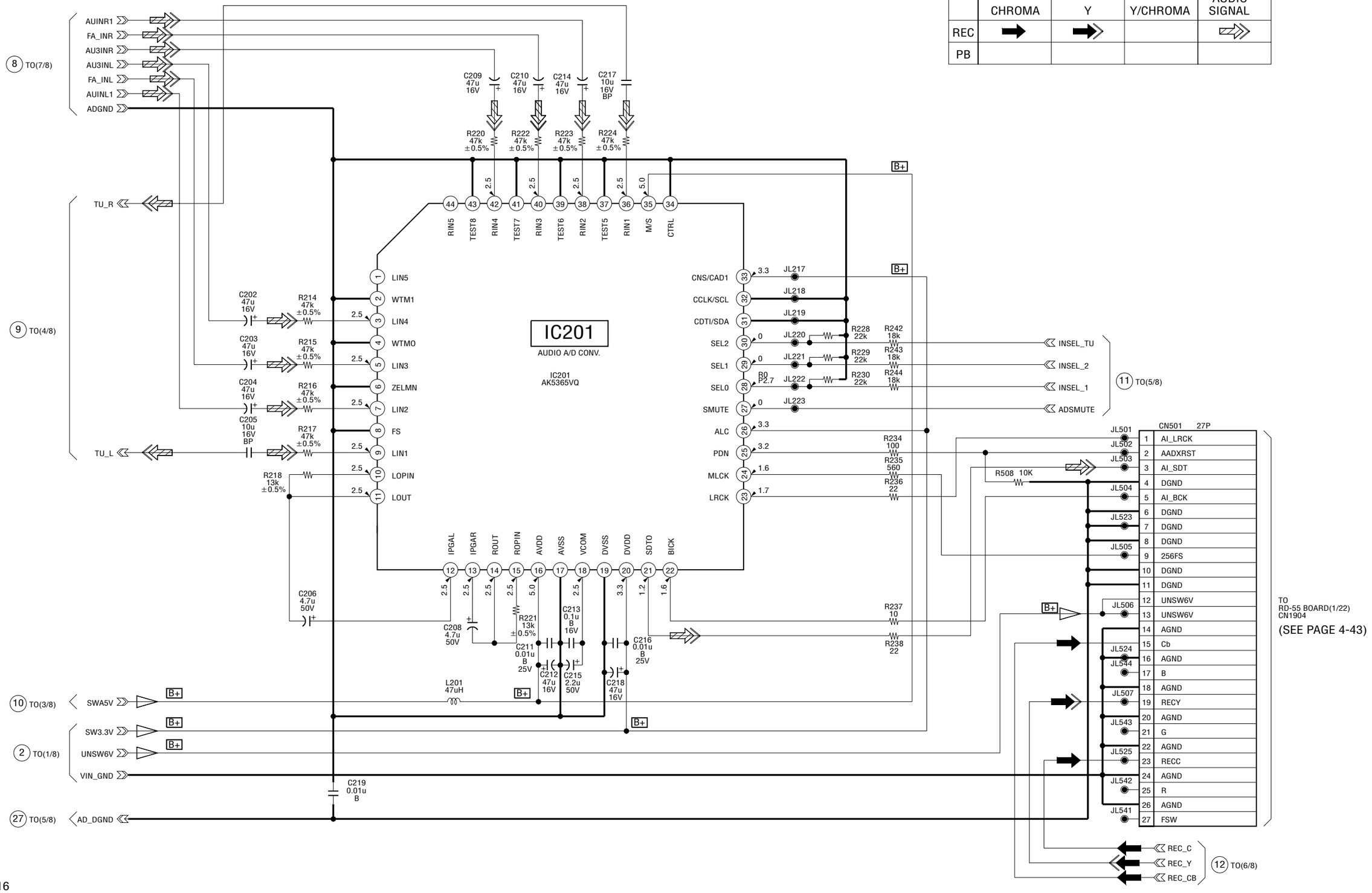
AUDIO IN

REF.NO.:10000 SERIES-

NO MARK:REC/PB MODE
R :REC MODE
P :PB MODE

SIGNAL PATH

	VIDEO SIGNAL			AUDIO SIGNAL
	CHROMA	Y	Y/CHROMA	
REC	➡	➡		⇨
PB				



AV-92 BOARD(3/8)

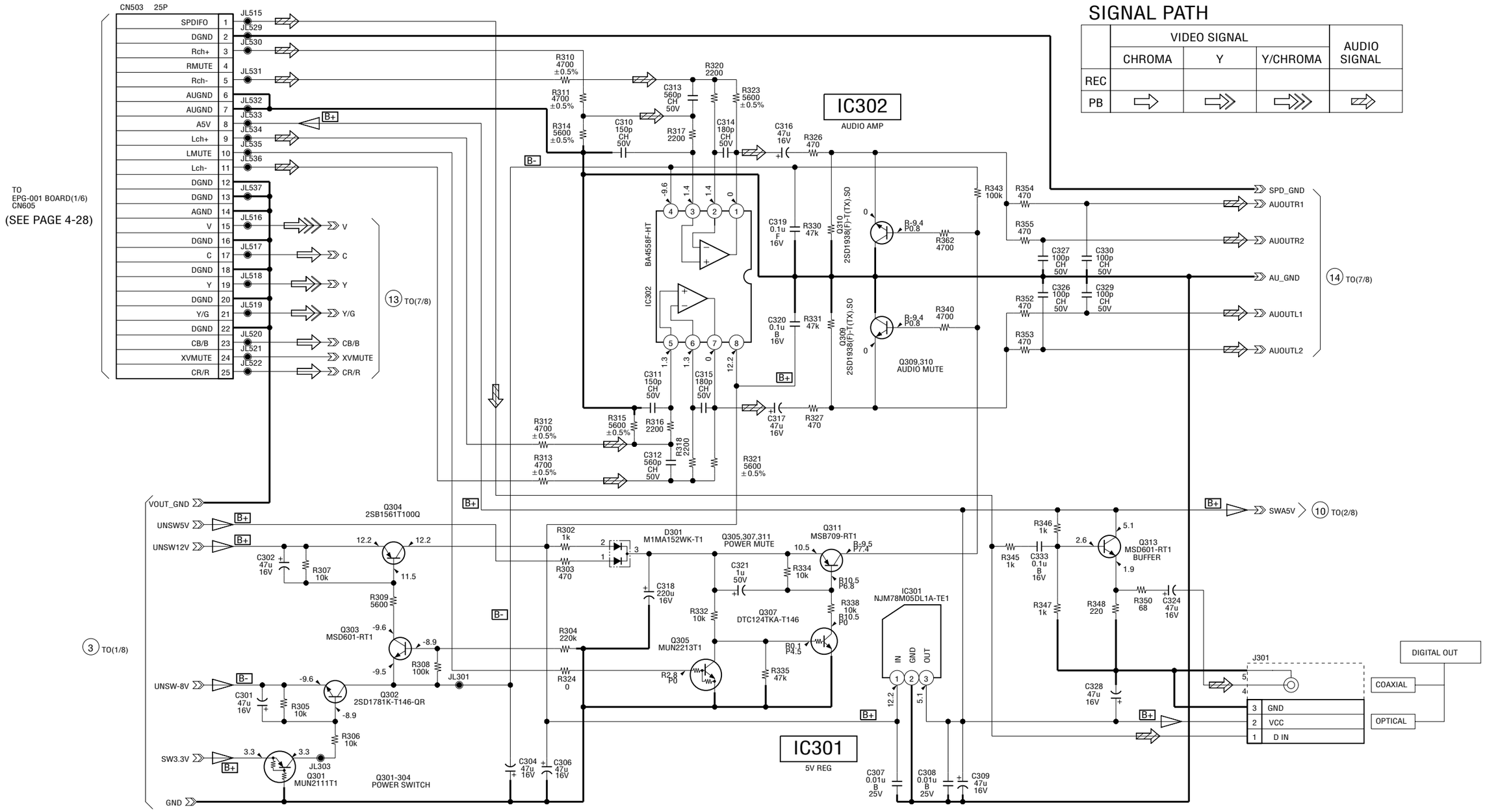
AUDIO OUT

-REF.NO.:10000 SERIES-

NO MARK:REC/PB MODE
R :REC MODE
P :PB MODE

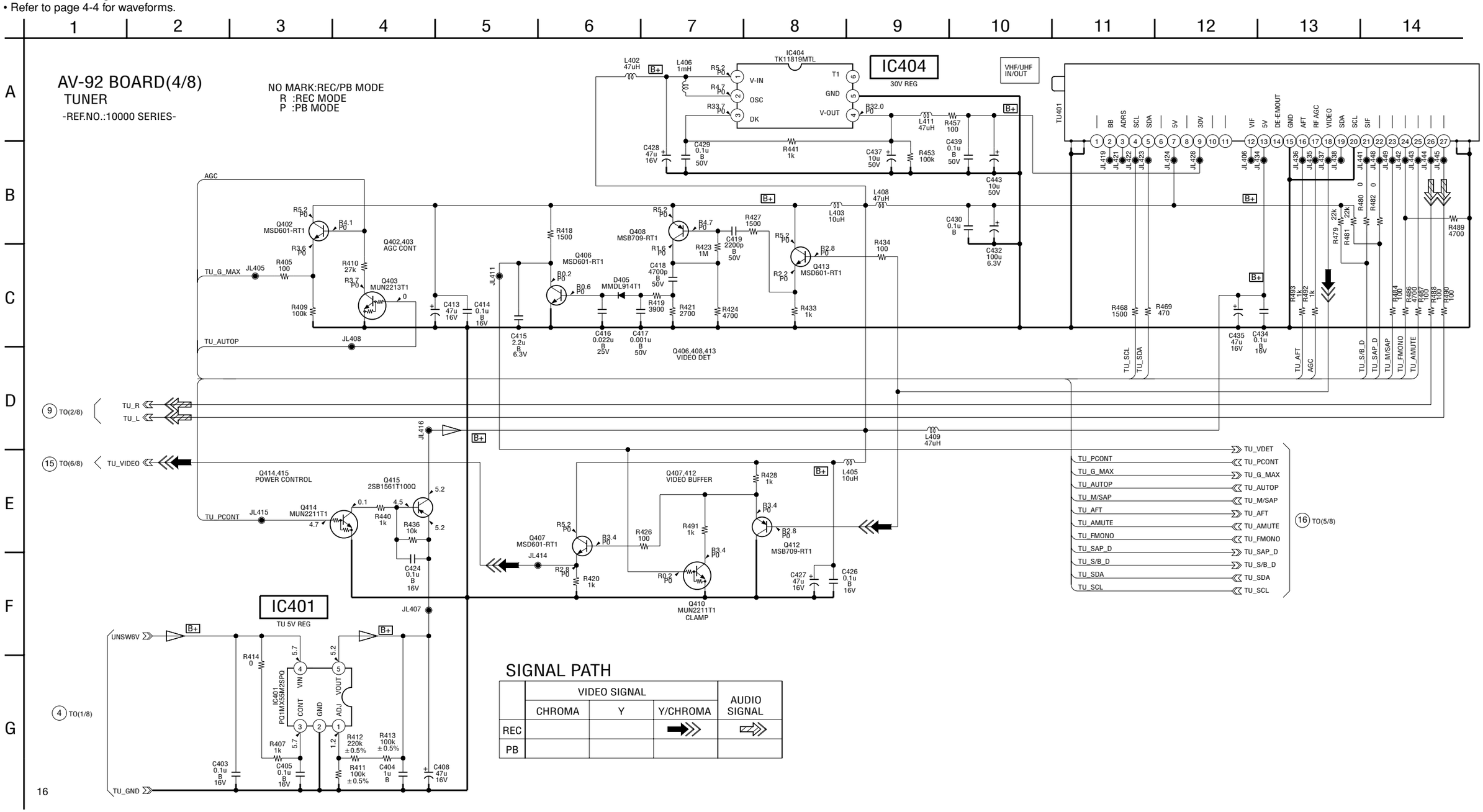
SIGNAL PATH

	VIDEO SIGNAL			AUDIO SIGNAL
	CHROMA	Y	Y/CHROMA	
REC				
PB	⇨	⇨	⇨	⇨



For Schematic Diagram

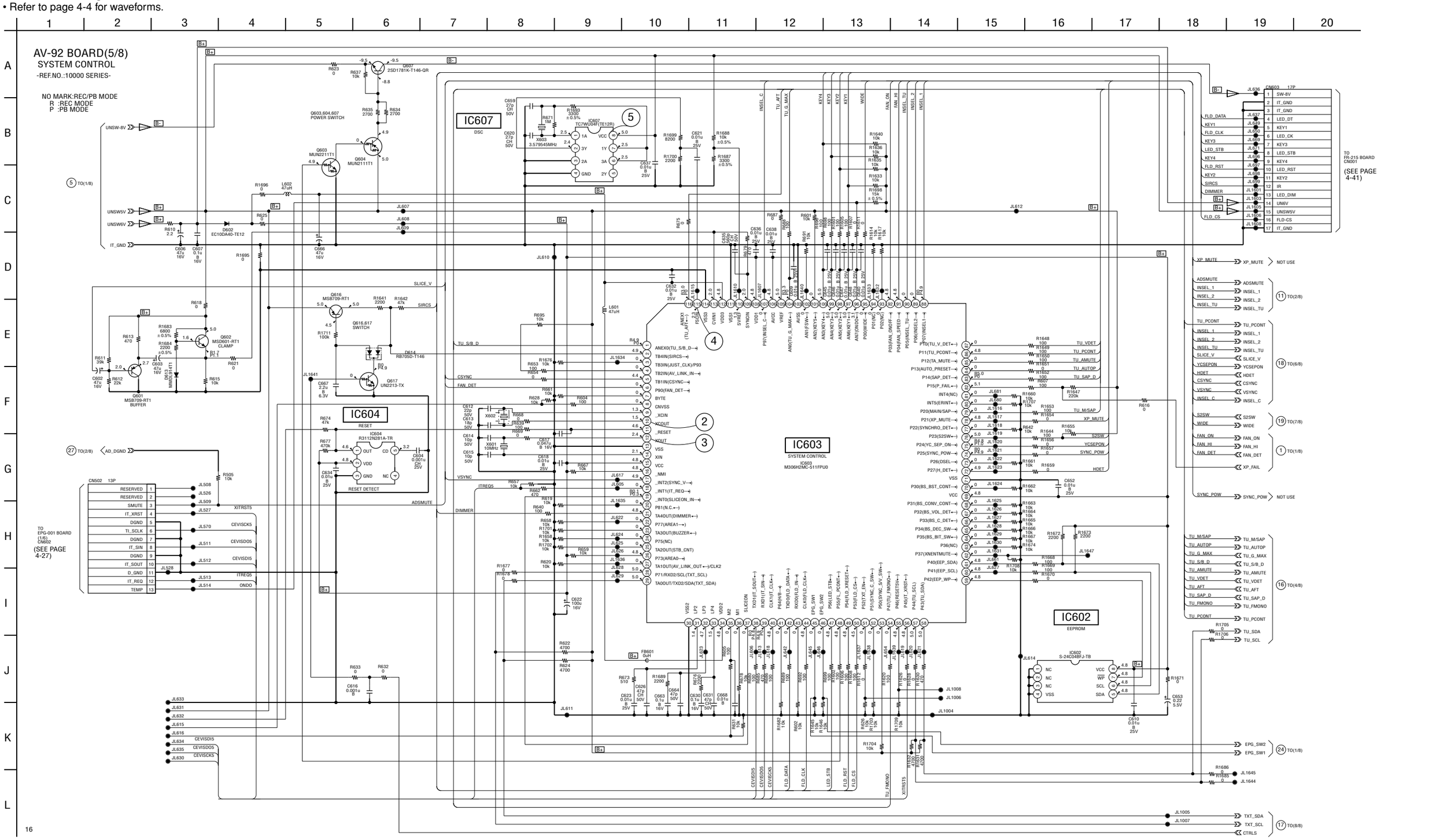
• Refer to page 4-4 for waveforms.



	VIDEO SIGNAL			AUDIO SIGNAL
	CHROMA	Y	Y/CHROMA	
REC			➡	⇨
PB				

For Schematic Diagram

• Refer to page 4-4 for waveforms.


AV-92 BOARD(5/8)
SYSTEM CONTROL
-REF.NO.:10000 SERIES-
NO MARK:REC/PB MODE
R :REC MODE
P :PB MODE
IC607
DSC
IC604
RESET
RESET DETECT
IC603
SYSTEM CONTROL
IC603
M306H2MC-511FPU0
IC602
EEPROM
S-24C04BFJ-TB
Q603,604,607
POWER SWITCH
Q616,617
SWITCH
Q601
MSB709-RT1
BUFFER
Q602
MSD601-RT1
CLAMP
Q616
MSB709-RT1
Q617
UN2213-TX
D607
2SD1781K-T146-QR
D602
EC10DA40-TE12
D614
RB705D-T146
D601
MMDL914T1
CN502 13P
RESERVED
SMUTE
IT_XRST
DGND
TI_SCLK
TI_SIN
IT_SOUT
D_GND
IT_REQ
TEMP
TO EPG-001 BOARD (1/6) CN602 (SEE PAGE 4-27)
CN603 17P
FLD_DATA
KEY1
FLD_CLK
KEY3
LED_STB
KEY4
FLD_RST
KEY2
SIRCS
DIMMER
FLD_CS
IR
LED_DIM
UN6V
UNSW5V
FLD-CS
IT_GND
TO FR-215 BOARD CN001 (SEE PAGE 4-41)
UNSW-8V
UNSW5V
UNSW6V
IT_GND
TO(1/8)
TO(2/8)
TO(6/8)
TO(7/8)
TO(1/8)
TO(4/8)
TO(8/8)
TO(1/8)
NOT USE
XP_MUTE
ADSMUTE
INSEL_1
INSEL_2
INSEL_TU
TU_PCONT
SLICE_V
YCSEPON
HDET
CSYNC
VSYNC
INSEL_C
S2SW
WIDE
FAN_ON
FAN_HI
FAN_DET
XP_FAIL
SYNC_POW
TU_M/SAP
TU_AUTOP
TU_G_MAX
TU_S/B_D
TU_AMUTE
TU_VDET
TU_AFT
TU_SAP_D
TU_FMONO
TU_SDA
TU_SCL
TXT_SDA
TXT_SCL
CTRLS
EPG_SW2
EPG_SW1
XITRST5
CEVISCK5
CEVISDO5
CEVISDI5
ITREQ5
ONDO
AD_DGND
SLICE_V
SIRCS
TU_S/B_D
CSYNC
FAN_DET
DIMMER
ADSMUTE
VSYNC
ITREQ5
INSEL_C
TU_AFT
TU_G_MAX
KEY4
KEY3
KEY2
KEY1
WIDE
FAN_ON
FAN_HI
INSEL_TU
INSEL_2
INSEL_1
JL612
JL611
JL610
JL607
JL608
JL609
JL1008
JL1006
JL1004
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JL1645
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JL1678
JL1679
JL1680
JL1681
JL1682
JL1683

AV-92 BOARD(6/8)

VIDEO IN

-REF.NO.:10000 SERIES-

NO MARK:REC/PB MODE
R :REC MODE
P :PB MODE

	VIDEO SIGNAL		
	CHROMA	Y	Y/CHROMA
REC	➡	➡	➡
PB			

IC701
VIDEO SELECT

For Schematic Diagram

• Refer to page 4-4 for waveforms.

AV-92 BOARD(7/8)

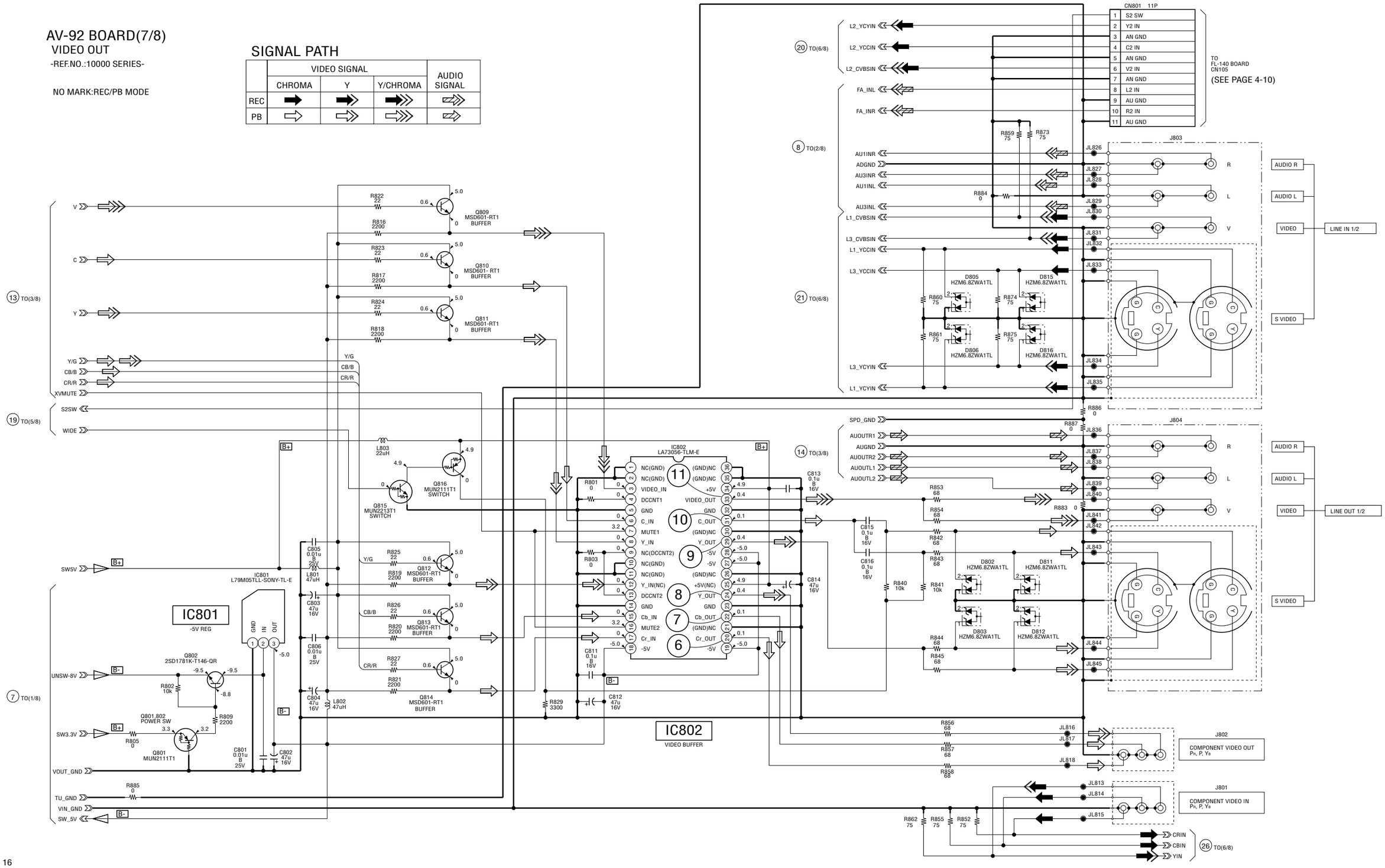
VIDEO OUT

-REF.NO.:10000 SERIES-

NO MARK:REC/PB MODE

SIGNAL PATH

	VIDEO SIGNAL			AUDIO SIGNAL
	CHROMA	Y	Y/CHROMA	
REC	➡	➡	➡	⇨
PB	⇨	⇨	⇨	⇨

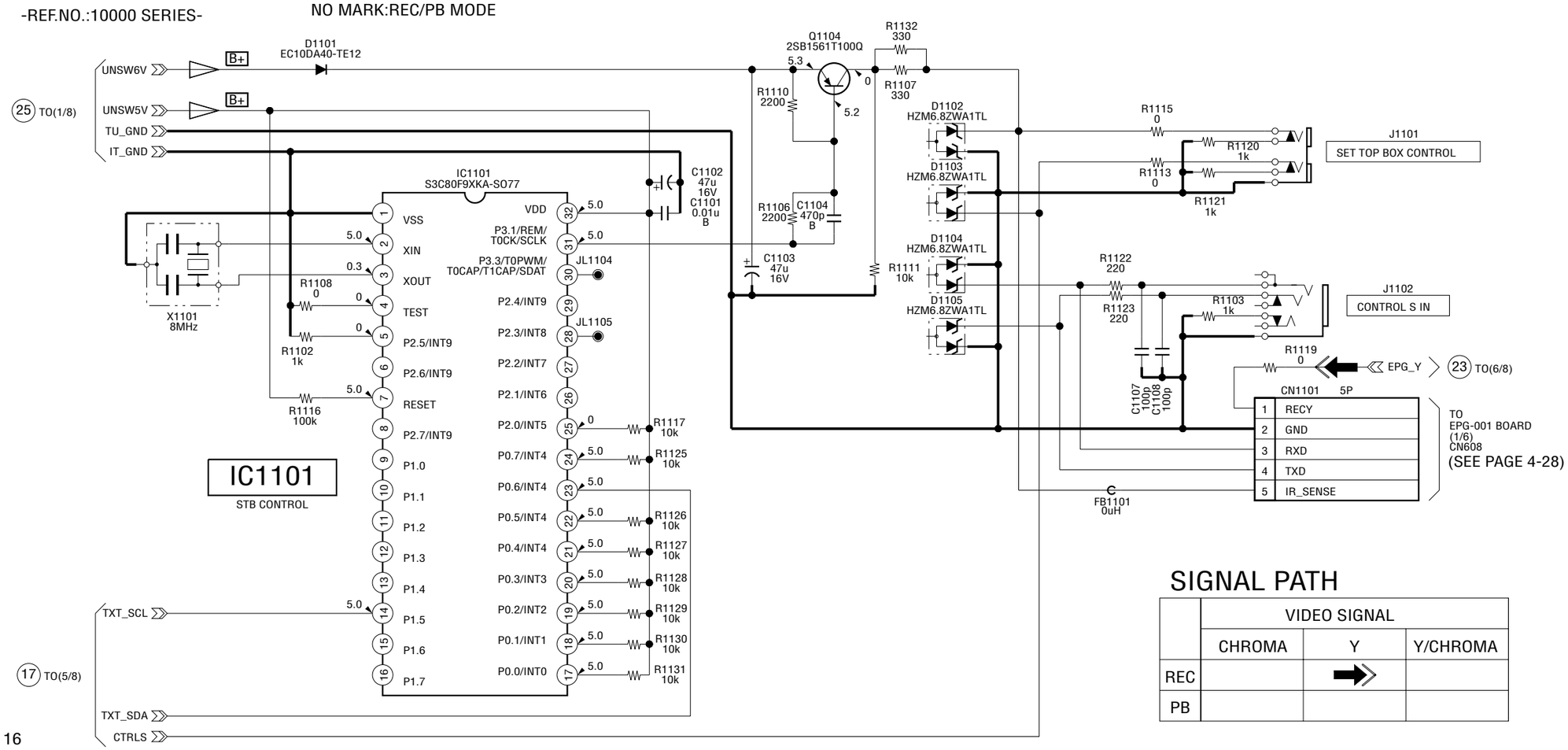


AV-92 BOARD(8/8)

STB CONTROL

-REF.NO.:10000 SERIES-

NO MARK:REC/PB MODE



SIGNAL PATH

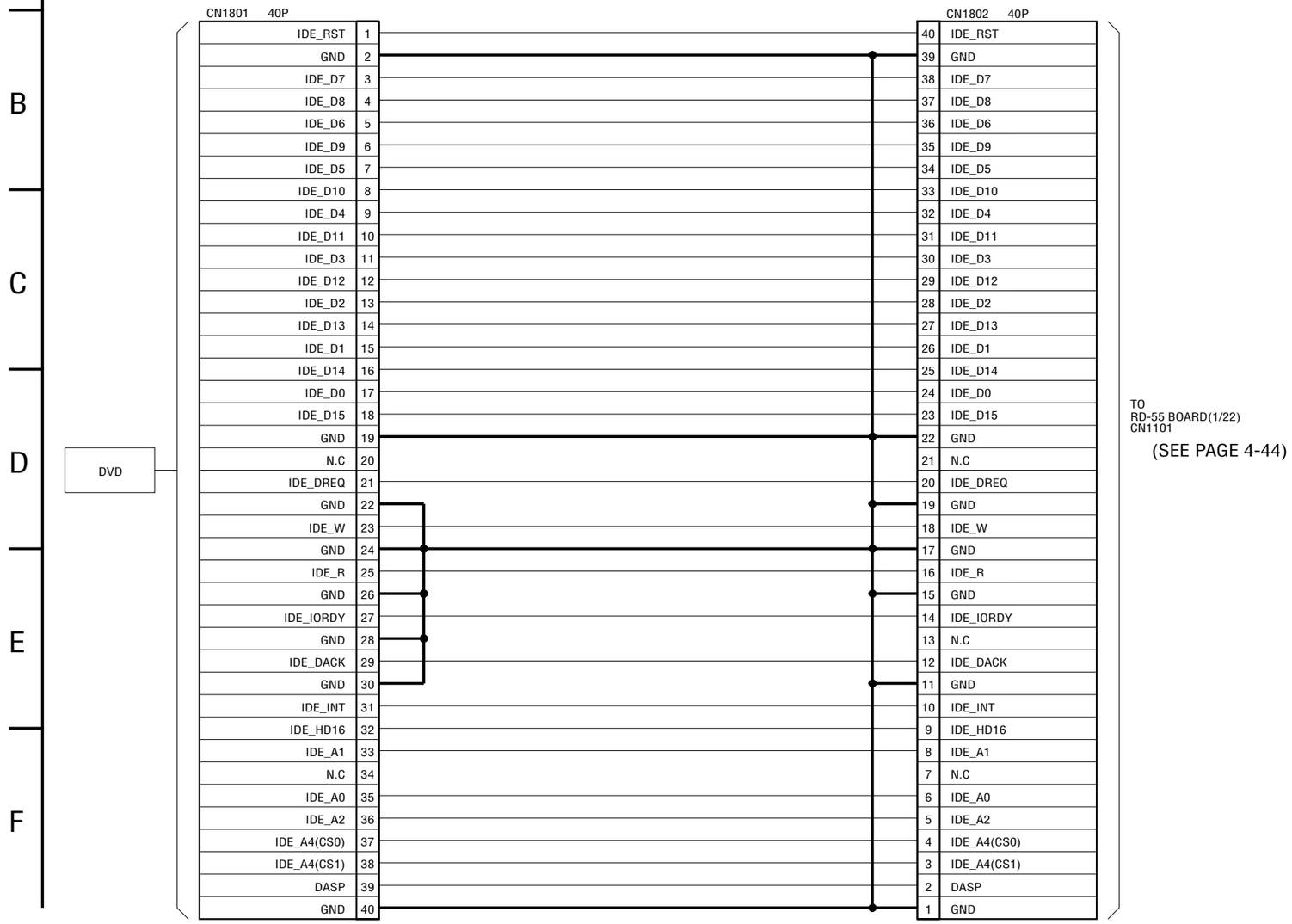
	VIDEO SIGNAL		
	CHROMA	Y	Y/CHROMA
REC		➡	
PB			

CN-199 BOARD

RELAY

-REF.NO.:30000 SERIES-

XX MARK:NO MOUNT

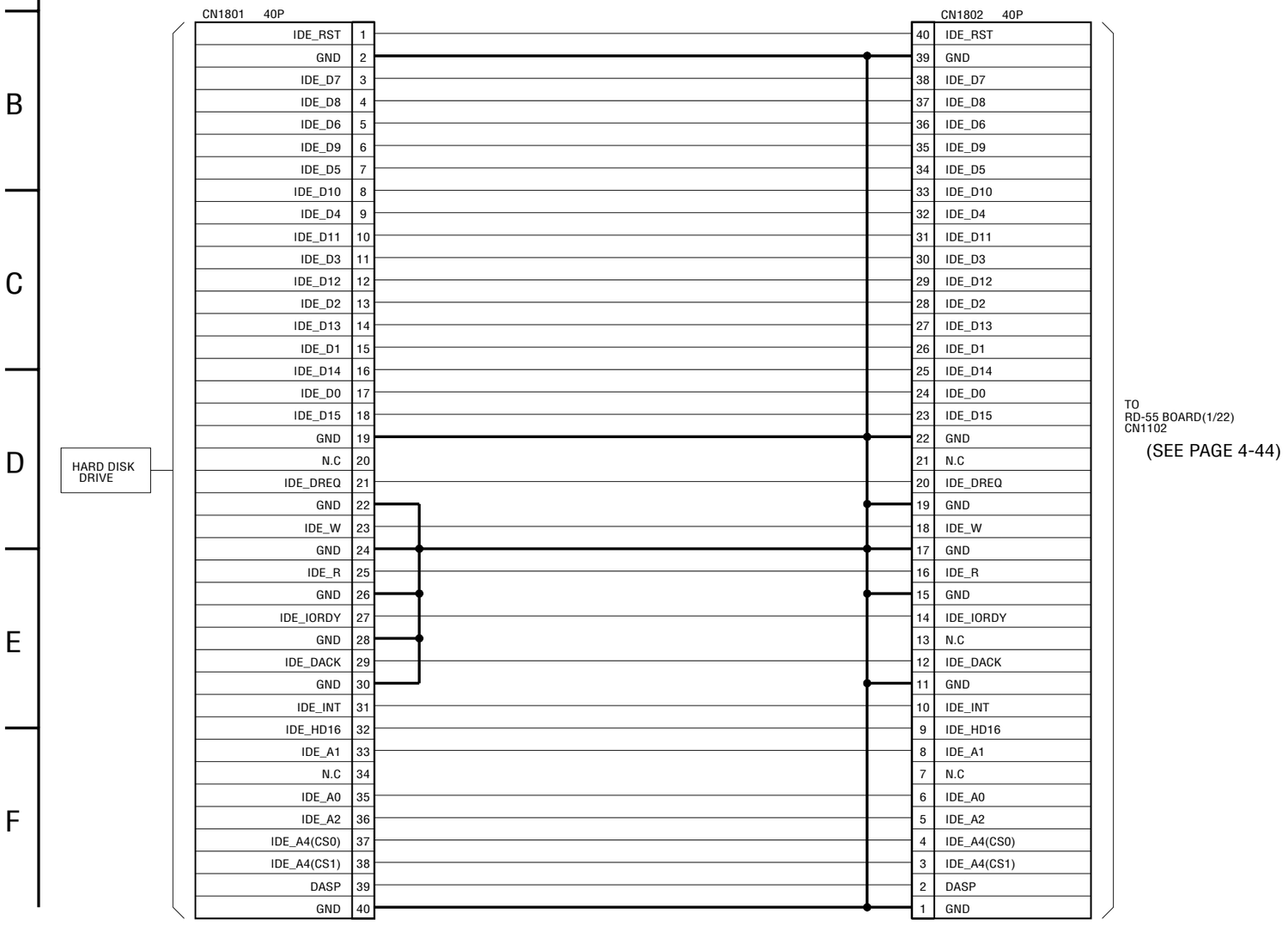


(SEE PAGE 4-44)

CN-220 BOARD

RELAY

-REF.NO.:30000 SERIES-
XX MARK:NO MOUNT



(SEE PAGE 4-44)

For Schematic Diagram

• Refer to page 4-89 for printed wiring board.

EPG-001 BOARD(1/6)

CONNECTOR,POWER

-REF.NO.: SERIES-

NO MARK:REC/PB MODE

SIGNAL PATH

	VIDEO SIGNAL			AUDIO SIGNAL
	CHROMA	Y	Y/CHROMA	
REC		➡		
PB	⇨	⇨	⇨	⇨

TO RD-55 BOARD(1/22) CN1905 (SEE PAGE 4-43)

CN604 13P

EPG_SDA	1	R603 150, R604 150, JL621, JL622, R619 0, R618 0, JL678, JL679 → EPG_SDA, EPG_SCL, EPG_RST → (1) TO(4/6)
EPG_SCL	2	
SMUTE	3	JL633 → SMUTE
IT_XRST	4	JL634 → IT_XRST
EPG_RST	5	
IT_SCLK	6	JL635 → IT_SCLK
DGND	7	R628 0
IT_SIN	8	JL636 → IT_SIN
DGND	9	
IT_SOUT	10	JL637 → IT_SOUT
DGND	11	JL638
IT_REQ	12	JL639 → IT_REQ
TEMP	13	JL640 → TEMP

CN602 13P

RESERVED	13	JL619
RESERVED	12	JL620
SMUTE	11	JL601 → SMUTE
IT_XRST	10	JL602 → IT_XRST
DGND	9	JL603
IT_SCLK	8	JL603 → IT_SCLK
DGND	7	JL604
IT_SIN	6	JL604 → IT_SIN
DGND	5	JL605
IT_SOUT	4	JL605 → IT_SOUT
DGND	3	JL606
IT_REQ	2	JL607 → IT_REQ
TEMP	1	JL608 → TEMP

TO AV-92 BOARD(5/8) CN502 (SEE PAGE 4-15)

R609 22k, S601 (RESET), R608 39k, R629 10k, R630 10k, Q001 MSD601-RT1 SWITCH

(1) TO(4/6)
(2) TO(2/6)
(3) TO(3/6)
(4) TO(6/6)
(5) TO(2/6)
(6) TO(3/6)
(7) TO(4/6)
(8) TO(5/6)
(9) TO(6/6)

IC703 9V REG

IC705 1.8V REG

Q702 2SB1561T100Q, Q701,702 SWITCH, Q701 MSD601-RT1, IC703 BA09FP-E2, IC705 PQ1L183M2SPQ

C703 47u 16V, C707 0.1u B, C711 0.1u B, C715 47u 16V, C717 0.1u B, C718 0.1u B, C719 47u 6.3V, C720 0.1u B, C721 47u 6.3V

V_OUT, C_OUT, Y_OUT, Y/G_OUT, CB/B_OUT, CR/R_OUT

V_IN, C_IN, Y_IN, Y/G_IN, CB/B_IN, CR/R_IN, EPG_SW2

V_IN, EPG_CVBS

Y/G_IN, RXD, TXD, IR_SENSE, EPG_SW2, EPG_SW1

SW9V, UNSW3.3V, SW5V, SW-5V, GND, UNSW1.8V

JL680, JL681, JL683, JL684, JL685

R610 100, R611 100, S603, R617 2200, R616 2200

SPDIFO, Rch+, RMUTE, Rch-, A5V, Lch+, LMUTE, Lch-

R627 0

CN605 25P

SPDIFO	JL641	25 SPDIFO
	JL642	24 DGND
Rch+	JL643	23 Rch+
RMUTE		22 RMUTE
Rch-	JL644	21 Rch-
		20 AUGND
	JL645	19 AUGND
A5V	JL646	18 A5V
Lch+	JL647	17 Lch+
LMUTE	JL648	16 LMUTE
Lch-	JL649	15 Lch-
		14 DGND
	JL650	13 DGND
		12 AGND
	JL651	11 V
		10 DGND
	JL652	9 C
		8 DGND
	JL653	7 Y
		6 DGND
	JL654	5 Y/G
		4 DGND
	JL655	3 CB/B
	JL656	2 XVMUTE
	JL657	1 CR/R

TO AV-92 BOARD(3/8) CN503 (SEE PAGE 4-11)

CN606 25P

SPDIFO	JL661	1 SPDIFO
	JL662	2 DGND
Rch+	JL663	3 Rch+
RMUTE		4 RMUTE
Rch-	JL664	5 Rch-
		6 AUGND
	JL665	7 AUGND
A5V	JL666	8 A5V
Lch+	JL667	9 Lch+
LMUTE	JL668	10 LMUTE
Lch-	JL669	11 Lch-
		12 DGND
	JL670	13 DGND
		14 AGND
	JL671	15 V
		16 DGND
	JL672	17 C
		18 DGND
	JL673	19 Y
		20 DGND
	JL674	21 Y/G
		22 DGND
	JL675	23 CB/B
	JL676	24 XVMUTE
	JL677	25 CR/R

TO RD-55 BOARD(1/22) CN1903 (SEE PAGE 4-43)

R623 560, R624 0, R625 0, R626 0, C606 100p, C607 100p

CN608 5P

1	RECY
2	GND
3	RXD
4	TXD
5	IR_SENSE

TO AV-92 BOARD(8/8) CN1101 (SEE PAGE 4-22)

C604 47u 6.3V, R620 0, R621 0, R622 0, R605 0, R606 0, R607 0, C603 47u 16V, C602 47u 16V

CN607 7P

1	UNSW3.3V
2	GND
3	UNSW12V
4	SW-5V
5	SW5V
6	EPG_SW2
7	EPG_SW1

TO AV-92 BOARD(1/8) CN504 (SEE PAGE 4-8)

For Schematic Diagram
• Refer to page 4-89 for printed wiring board.

EPG-001 BOARD(2/6)

RGB ENCODER

-REF.NO.: SERIES-

NO MARK:REC/PB MODE

IC501 VIDEO ENCODER — IC501 TA1287FG(EL)

IC502 VIDEO ENCODER — IC502 BH7236AF-E2

IC503 SWITCH — IC503 NJM2284V(TE2)

IC504 SWITCH — IC504 NJM2286V(TE2)

Q501-506 BUFFER — Q501 MSB709-RT1, Q502 MSB709-RT1, Q503 MSB709-RT1, Q504 MSB709-RT1, Q505 MSB709-RT1, Q506 MSB709-RT1

C_CYNC, CP, CVBS_SW, R_OUT, G_OUT, B_OUT, UNSW3.3V, SW5V, SW-5V, GND, SW9V

CB/B_IN, CB/B_OUT, Y/G_OUT, Y/G_IN, EPG_SW2, CR/R_OUT, CR/R_IN, V_OUT, C_OUT, C_IN, Y_OUT, Y_IN, V_IN

10 TO(6/6), 11 TO(3/6), 5 TO(1/6), 2 TO(1/6)

SIGNAL PATH

	VIDEO SIGNAL		
	CHROMA	Y	Y/CHROMA
REC			
PB	⇨	⇨	⇨

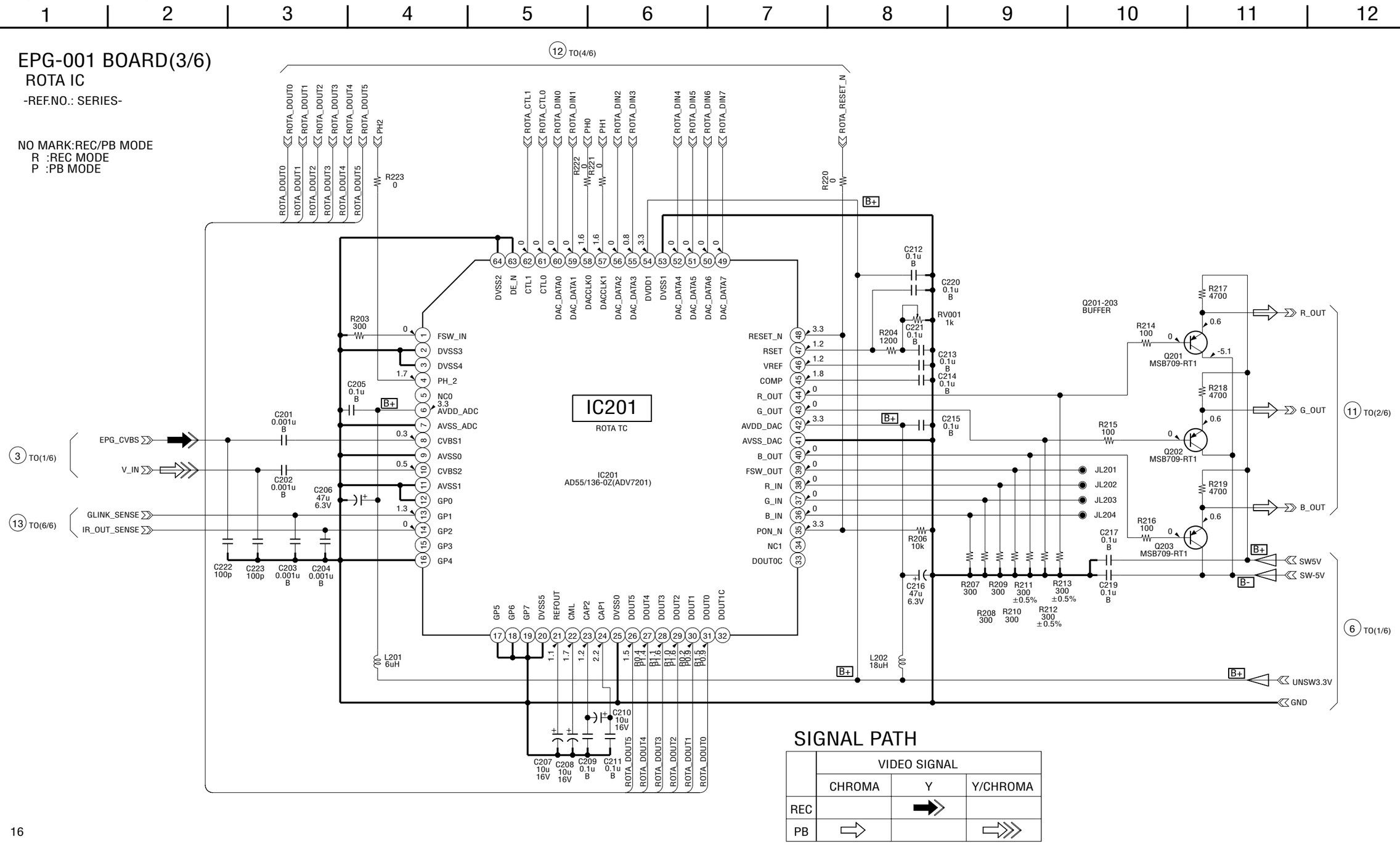
For Schematic Diagram
• Refer to page 4-89 for printed wiring board.

EPG-001 BOARD(3/6)

ROTA IC

-REF.NO.: SERIES-

NO MARK:REC/PB MODE
R :REC MODE
P :PB MODE



SIGNAL PATH

	VIDEO SIGNAL		
	CHROMA	Y	Y/CHROMA
REC		⇒	
PB	⇨		⇨

For Schematic Diagram

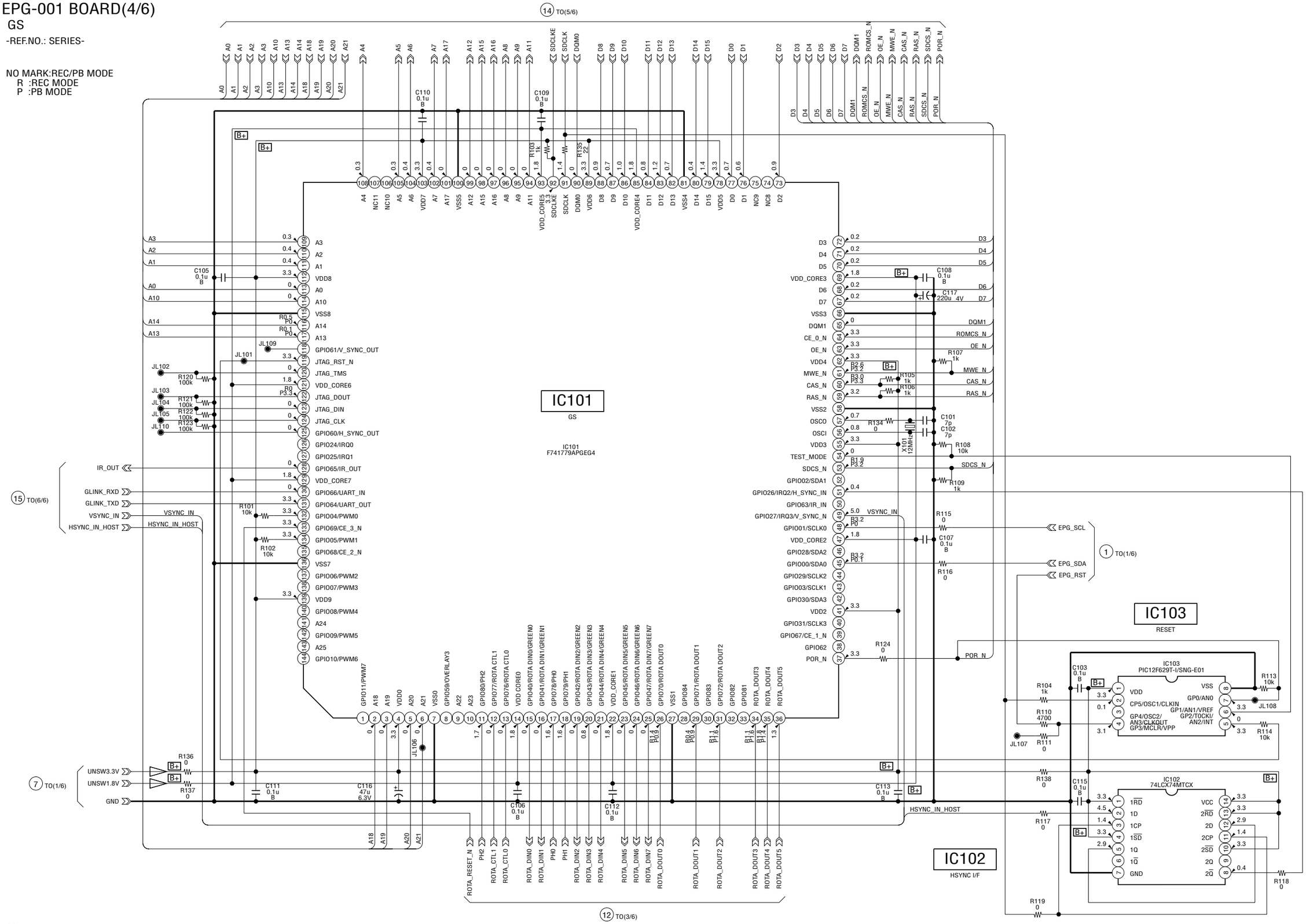
• Refer to page 4-89 for printed wiring board.

EPG-001 BOARD(4/6)

GS

-REF.NO.: SERIES-

NO MARK:REC/PB MODE
R :REC MODE
P :PB MODE



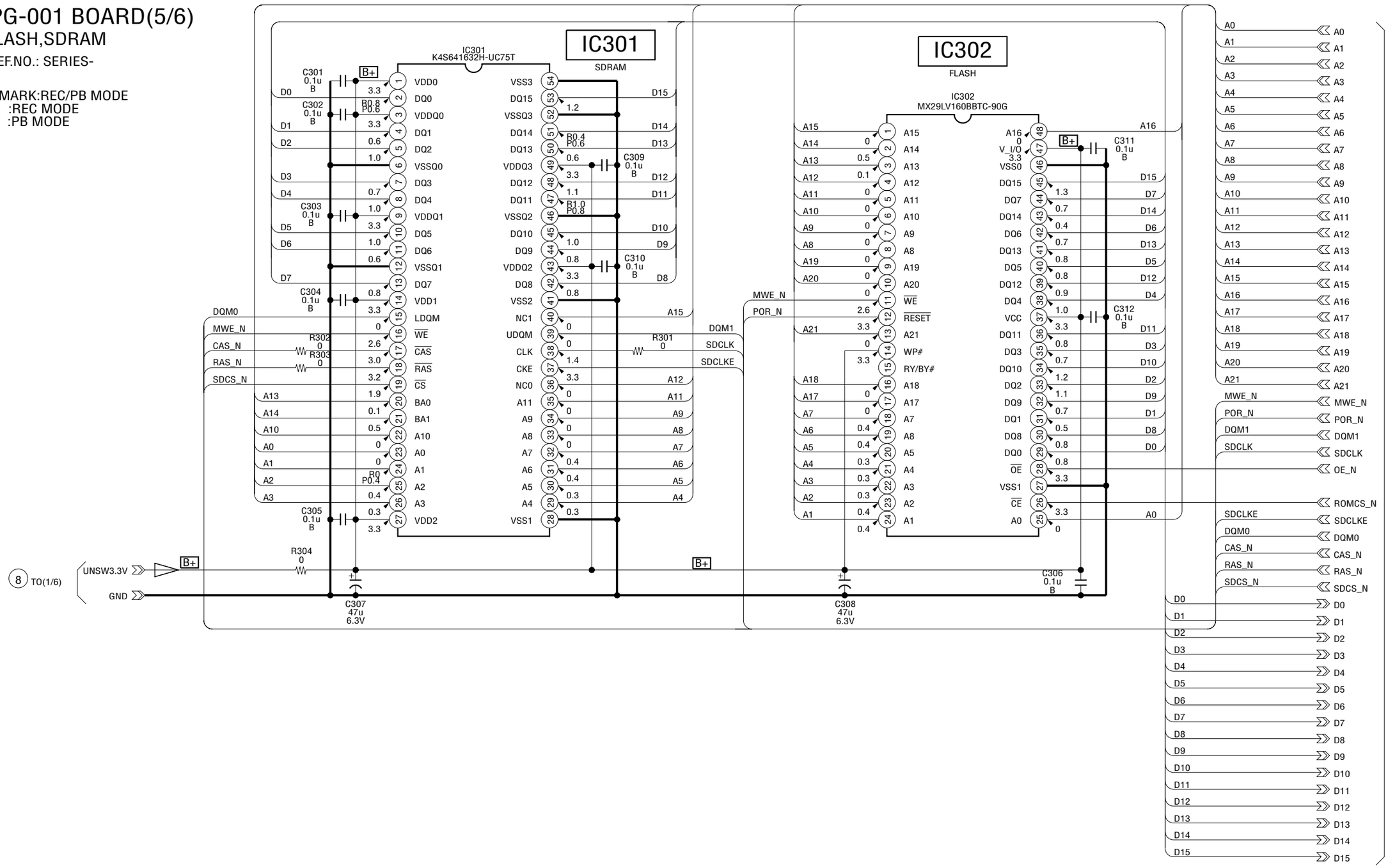
For Schematic Diagram
• Refer to page 4-89 for printed wiring board.

EPG-001 BOARD(5/6)

FLASH,SDRAM

-REF.NO.: SERIES-

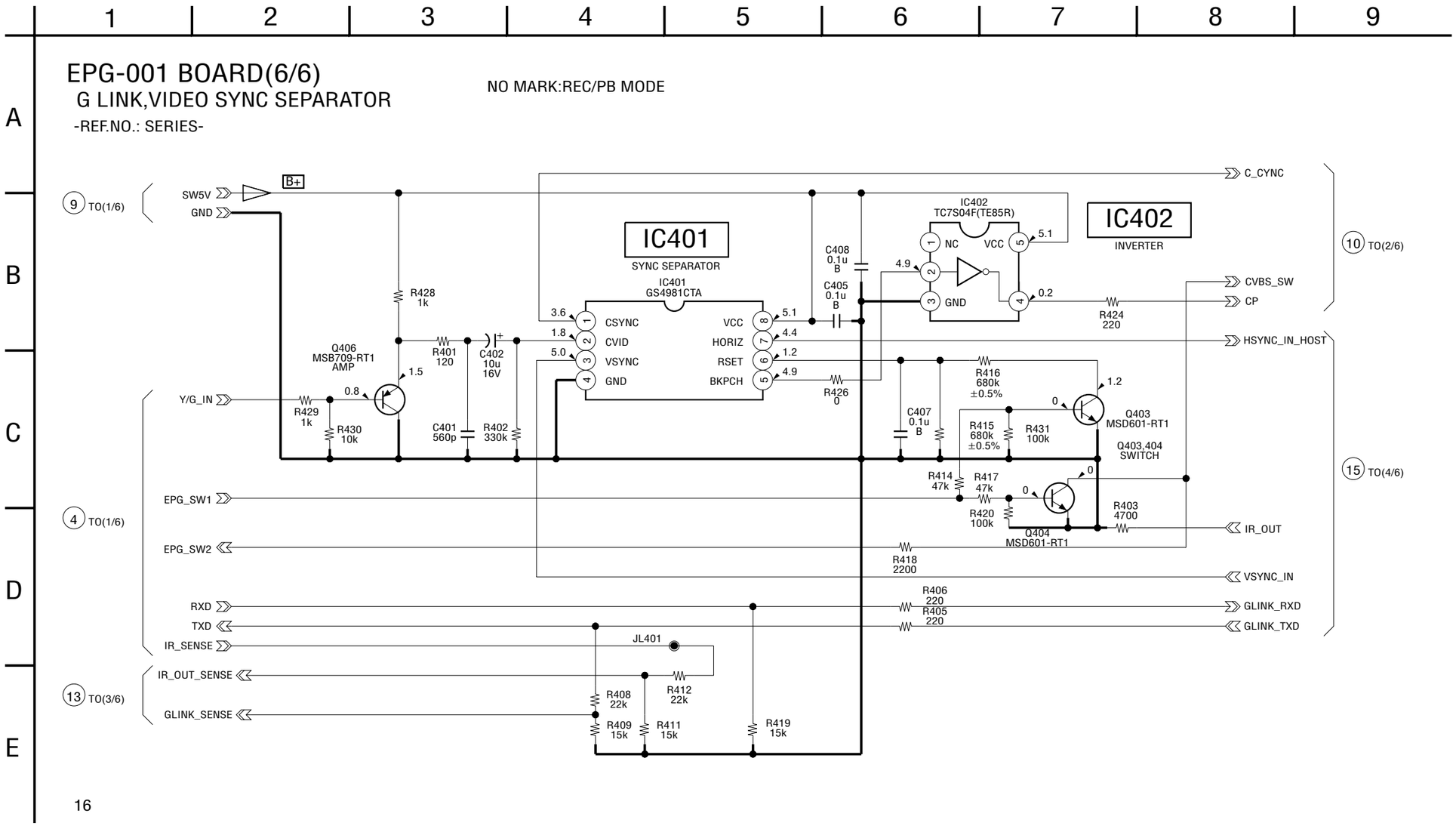
NO MARK:REC/PB MODE
R :REC MODE
P :PB MODE



FLASH, SDRAM
EPG-001 (5/6)

For Schematic Diagram

• Refer to page 4-89 for printed wiring board.



G LINK,VIDEO SYNC SEPARATOR

EPG-001 (6/6)

FL-140 BOARD
DV/LINE 2 IN/FL DRIVER
-REF.NO.:40000 SERIES-

NO MARK:REC/PB MODE

ND101 FLUORESCENT INDICATOR TUBE

ET101

CN102 9P

TO FR-215 BOARD CN002 (SEE PAGE 4-42)

S101 I/⏻ (ON/Standby)

IC101 INDICATOR TUBE DRIVER

IC101 ML9208-02MBZ03B

L101 47uH

Q101 2SC5053T100Q

Q102 2SC5053T100Q

Q101.102 SWITCHING

T101 CONVERTOR TRANSFORMER

Q103 2SB1197K-T-146-R SWITCH

D111 1SS355TE-17

D112 1SS355TE-17

D101 1SS355TE-17

D110 1SS355TE-17

D113 UDZSTE-1727B

D114 MA8082-L-TX

D102 STZ6.8N-T146

D104 STZ6.8N-T146

D105 STZ6.8N-T146

D106 STZ6.8N-T146

D107 STZ6.8N-T146

D108 STZ6.8N-T146

D109 STZ6.8N-T146

J101 LINE 2 IN

S VIDEO

VIDEO

AUDIO L (MONO)

AUDIO R

DV IN

CN103 4P

CN105 11P

TO AV-92 BOARD(7/8) CN801 (SEE PAGE 4-20)

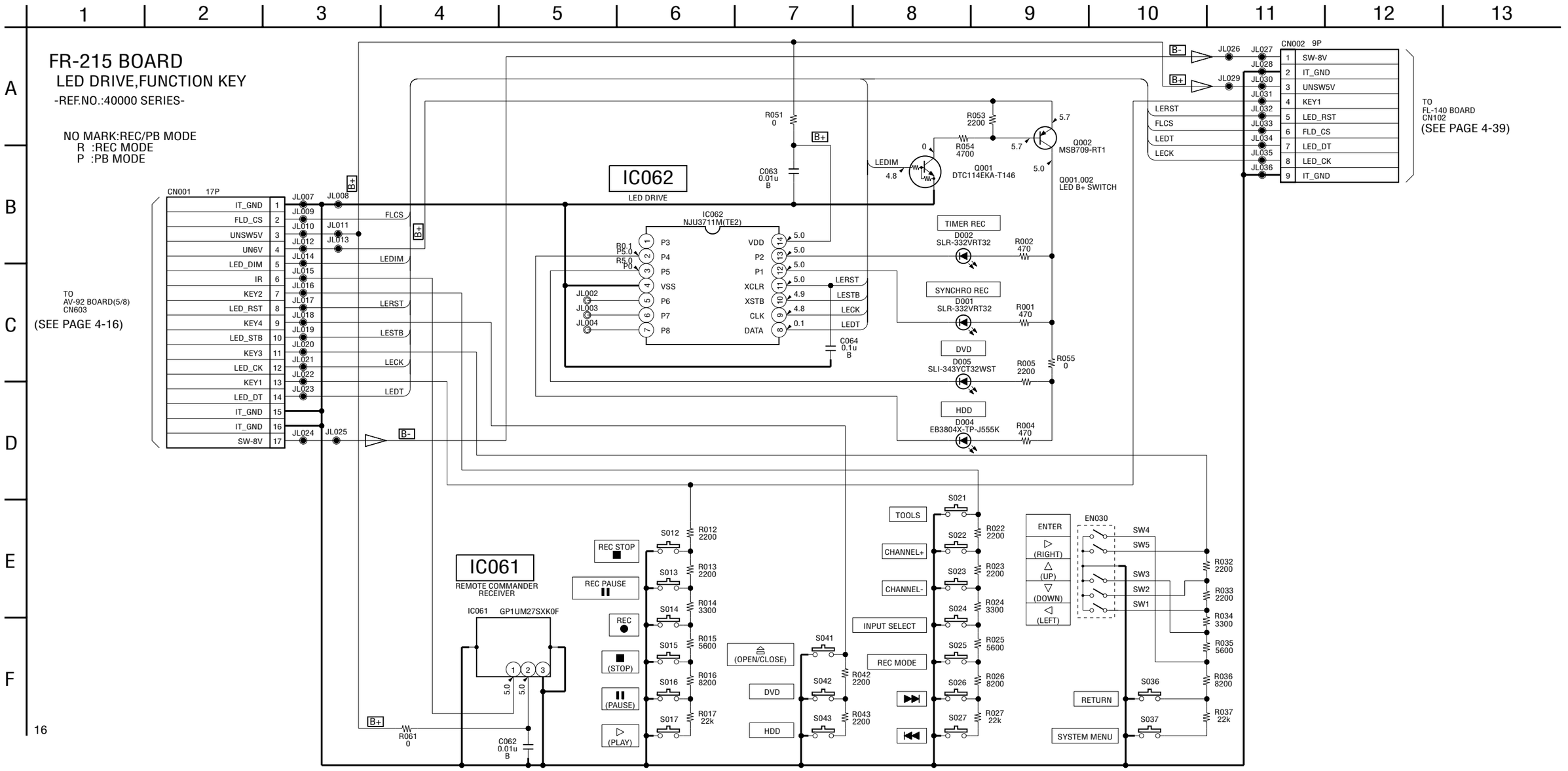
CN104 6P

TO RD-55 BOARD(21/22) CN2201 (SEE PAGE 4-84)

SIGNAL PATH

	VIDEO SIGNAL			AUDIO SIGNAL
	CHROMA	Y	Y/CHROMA	
REC	➡	➡	➡	⇨
PB			⇨	⇨

For Schematic Diagram
• Refer to page 4-5, 4-6 for waveforms.



For Schematic Diagram

• Refer to page 4-93 for printed wiring board.

RD-55 BOARD(1/22)

CONNECTOR

-REF.NO.:20000 SERIES-

SIGNAL PATH

	VIDEO SIGNAL			AUDIO SIGNAL
	CHROMA	Y	Y/CHROMA	
REC	➡	➡	➡	⇨
PB	⇨	⇨	⇨	⇨

TO AV-92 BOARD(2/8) CN501 (SEE PAGE 4-10)

CN1904 27P

AI_LRCK 1 — JL1904 — R1916 0 — ADLRCKI
AADXRST 2 — JL1910
AI_SDT 3 — JL1906 — R1901 0 — ADDATI — 1 TO(3/22)
DGND 4 — JL1909
AI_BCK 5 — JL1902 — R1912 0 — ADBCKI
DGND 6
DGND 7
DGND 8
256FS 9 — JL1901 — FB1901 — PLL256L1 — 2 TO(18/22)
DGND 10
DGND 11 — JL1911 — R1917 0 — B+ — VDEC6V
UNSW6V 12 — JL1912 — XSWGBRST2
UNSW6V 13
AGND 14
Cb 15 — JL1953 — reccb
AGND 16
B 17
AGND 18
RECY 19 — JL1915 — RECY — 3 TO(2/22)
AGND 20
G 21
AGND 22
RECC 23 — JL1917 — RECC
AGND 24
R 25
AGND 26
FSW 27

TO EPG-001 BOARD(1/6) CN604 (SEE PAGE 4-27)

CN1905 13P

EPG_SDA 1 — R1919 0 — EPG_SCL
EPG_SCL 2 — R1918 0 — EPG_SDA
SMUTE 3 — JL1934 — XVMUTE
IT_XRST 4 — JL1919 — R1911 0 — ADSMUTE
EPGREST 5 — JL1962 — R1922 0 — XITRST5
IT_SCLK 6 — JL1921 — EPGRST
DGND 7 — R1913 0 — ITSCK5
IT_SIN 8 — JL1923
DGND 9 — JL1956 — R1914 0 — ITSDO5 — 5 TO(12/22)
IT_SOUT 10 — JL1925
DGND 11 — JL1957 — R1915 0 — ITSDI5
IT_REQ 12 — JL1927 — ITREQ5
TEMP 13 — JL1932 — TH1901 — XSWGBRST2

TO EPG-001 BOARD(1/6) CN606 (SEE PAGE 4-28)

CN1903 25P

SPDIFO 1 — JL1938 — R1903 0 — SPDIFAO
DGND 2
Rch+ 3 — JL1939 — AOUTR+
RMUTE 4 — JL1940 — NOT USE
Rch- 5 — JL1941 — AOUTR-
AUGND 6 — JL1958 — C1901 0.01u B
AUGND 7 — JL1959 — AUGND — 6 TO(12/22)
A5V 8 — JL1942 — R1904 0 — B+ — A5V
Lch+ 9 — JL1943 — AOUTL+
LMUTE 10 — JL1944 — XLMUTE
Lch- 11 — JL1945 — AOUTL-
DGND 12 — JL1960
DGND 13 — JL1961
DGND 14
V 15 — JL1946 — R1905 0 — V
DGND 16 — R1906 0
C 17 — JL1947 — C — 7 TO(10/22)
DGND 18 — R1907 0
Y 19 — JL1948 — Y
DGND 20 — R1908 0
Y/G 21 — JL1949 — Y/G
DGND 22 — R1909 0
CB/B 23 — JL1950 — CB/B — 8 TO(8/22)
XVMUTE 24 — JL1951 — R1910 0
CR/R 25 — JL1952 — CR/R
DGND

10 TO(19/22)

DGND
SW3.3V — B+ — C1130 0.1u B — C1131 0.1u B — C1132 0.1u B — C1133 0.1u B

ATP_D0 ATP_D1 ATP_D2 ATP_D3 ATP_D4 ATP_D5 ATP_D6 ATP_D7 ATP_D8 ATP_D9 ATP_D10 ATP_D11 ATP_D12 ATP_D13 ATP_D14 ATP_D15 ATP_A0 ATP_A1 ATP_A2 ATP_A3 ATP_A4 ATP_INTRQ ATP_XDMAC ATP_IORDY ATP_XDIOR ATP_XDIOW ATP_DMARQ ATP_XRESET

34 TO(5/22)

ATS_D0 ATS_D1 ATS_D2 ATS_D3 ATS_D4 ATS_D5 ATS_D6 ATS_D7 ATS_D8 ATS_D9 ATS_D10 ATS_D11 ATS_D12 ATS_D13 ATS_D14 ATS_D15 ATS_A0 ATS_A1 ATS_A2 ATS_A3 ATS_A4 ATS_INTRQ ATS_XDMAC ATS_IORDY ATS_XDIOR ATS_XDIOW ATS_DMARQ ATS_XRESET

ATP_A3 — JL1107 JL1108 JL1109 JL1110 — RB1101 33X4
ATP_A4
ATP_A2
ATP_A0
ATP_A1 — JL1112 JL1113 — R1170 33
ATP_INTRQ — JL1114 — R1171 82 — R1166 10k
ATP_XDMAC — JL1115 — R1172 22 — R1198 1k
ATP_IORDY — JL1116 — R1173 82
ATP_XDIOR — JL1117 — R1174 22
ATP_XDIOW — JL1118 — R1175 22
ATP_DMARQ — JL1119 — R1176 82 — R1167 5600
ATP_D15 — JL1120 JL1121 JL1122 JL1123 JL1124 JL1125 JL1126 JL1127 JL1128 JL1129 JL1130 JL1131 JL1132 JL1133 JL1134 JL1135 — RB1102 33X4 RB1103 33X4 RB1104 33X4 RB1105 33X4
ATP_D0
ATP_D14
ATP_D1
ATP_D13
ATP_D2
ATP_D12
ATP_D3
ATP_D11
ATP_D4
ATP_D10
ATP_D5
ATP_D9
ATP_D6
ATP_D8
ATP_D7
ATP_XRESET — JL1136 — R1177 33

CN1101 40P

JL1167	1	GND
	2	DASP
	3	IDE_A3(CS1)
	4	IDE_A4(CS0)
	5	IDE_A2
	6	IDE_A0
	7	NC
	8	IDE_A1
	9	IDE_HD16
	10	IDE_INT
	11	GND
	12	IDE_DACK
	13	NC
	14	IDE_IORDY
	15	GND
	16	IDE_R
	17	GND
	18	IDE_W
	19	GND
	20	IDE_DREQ
	21	NC
	22	GND
	23	IDE_D15
	24	IDE_D0
	25	IDE_14
	26	IDE_D1
	27	IDE_D13
	28	IDE_D2
	29	IDE_D12
	30	IDE_D3
	31	IDE_D11
	32	IDE_D4
	33	IDE_D10
	34	IDE_D5
	35	IDE_D9
	36	IDE_D6
	37	IDE_D8
	38	IDE_D7
JL1168	39	GND
	40	IDE_RST

TO CN-199 BOARD CN1802 (SEE PAGE 4-24)

ATS_A3 — JL1137 JL1138 JL1139 JL1140 — RB1106 33x4
ATS_A4
ATS_A2
ATS_A0
ATS_A1 — JL1141 JL1142 — R1178 33
ATS_INTRQ — JL1143 — R1179 82 — R1168 10k
ATS_XDMAC — JL1144 — R1180 22 — R4104 1k
ATS_IORDY — JL1145 — R1181 82
ATS_XDIOR — JL1146 — R1182 22
ATS_XDIOW — JL1147 — R1183 22
ATS_DMARQ — JL1148 — R1184 82 — R1169 5600
ATS_D15 — JL1149 JL1150 JL1151 JL1152 JL1153 JL1154 JL1155 JL1156 JL1157 JL1158 JL1159 JL1160 JL1161 JL1162 JL1163 JL1164 — RB1107 33x4 RB1108 33x4 RB1109 33x4 RB1110 33x4
ATS_D0
ATS_D14
ATS_D1
ATS_D13
ATS_D2
ATS_D12
ATS_D3
ATS_D11
ATS_D4
ATS_D10
ATS_D5
ATS_D9
ATS_D6
ATS_D8
ATS_D7
ATS_XRESET — JL1165 — R1185 33

CN1102 40P

JL1169 JL1166	1	GND
	2	DASP
	3	IDE_A3(CS1)
	4	IDE_A4(CS0)
	5	IDE_A2
	6	IDE_A0
	7	NC
	8	IDE_A1
	9	IDE_HD16
	10	IDE_INT
	11	GND
	12	IDE_DACK
	13	NC
	14	IDE_IORDY
	15	GND
	16	IDE_R
	17	GND
	18	IDE_W
	19	GND
	20	IDE_DREQ
	21	NC
	22	GND
	23	IDE_D15
	24	IDE_D0
	25	IDE_14
	26	IDE_D1
	27	IDE_D13
	28	IDE_D2
	29	IDE_D12
	30	IDE_D3
	31	IDE_D11
	32	IDE_D4
	33	IDE_D10
	34	IDE_D5
	35	IDE_D9
	36	IDE_D6
	37	IDE_D8
	38	IDE_D7
JL1170	39	GND
	40	IDE_RST

TO CN-220 BOARD CN1802 (SEE PAGE 4-26)

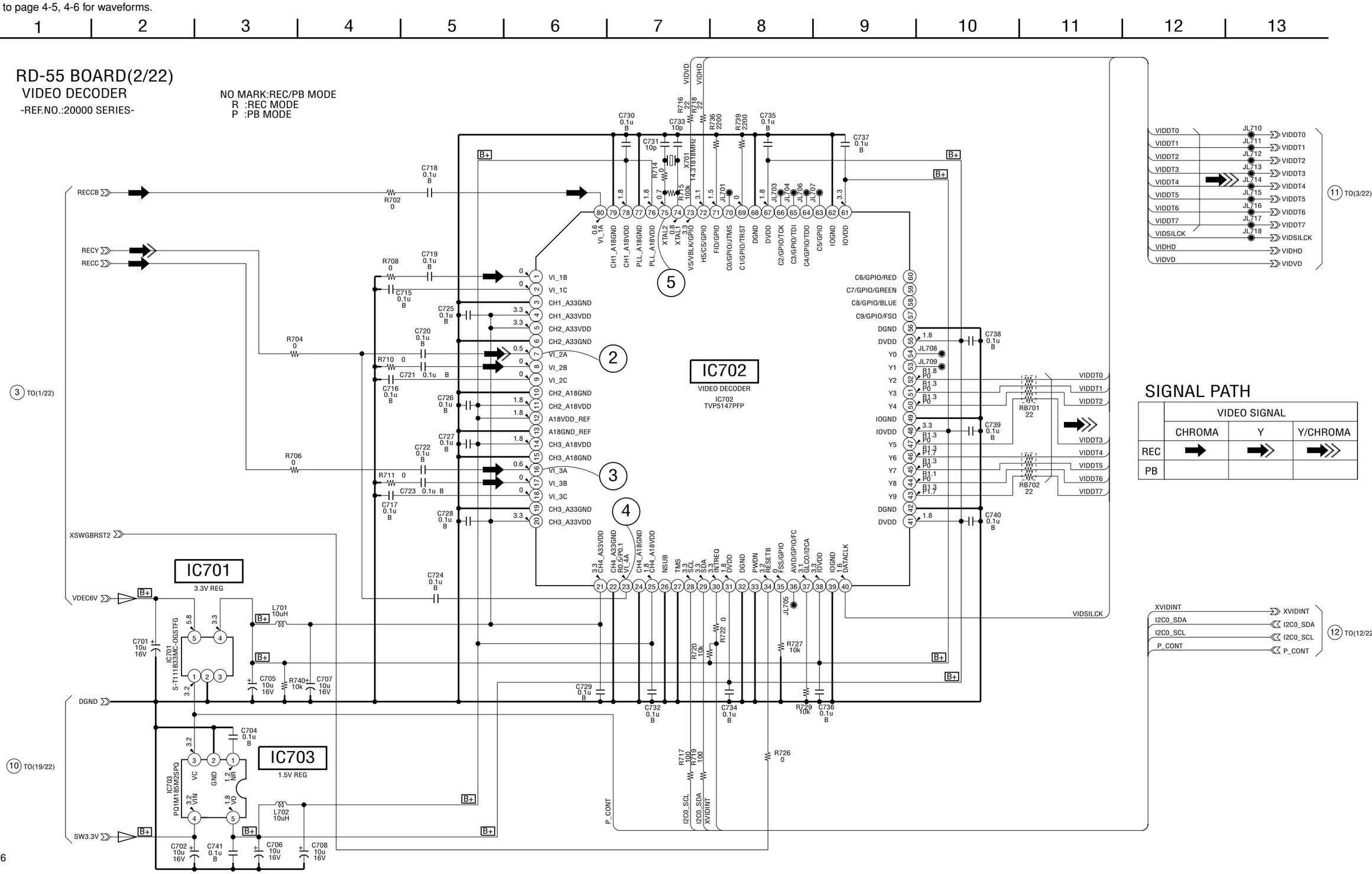
For Schematic Diagram
- Refer to page 4-93 for printed wiring board.
- Refer to page 4-5, 4-6 for waveforms.

RD-55 BOARD(2/22)

VIDEO DECODER

-REF.NO.:20000 SERIES-

NO MARK:REC/PB MODE
R :REC MODE
P :PB MODE

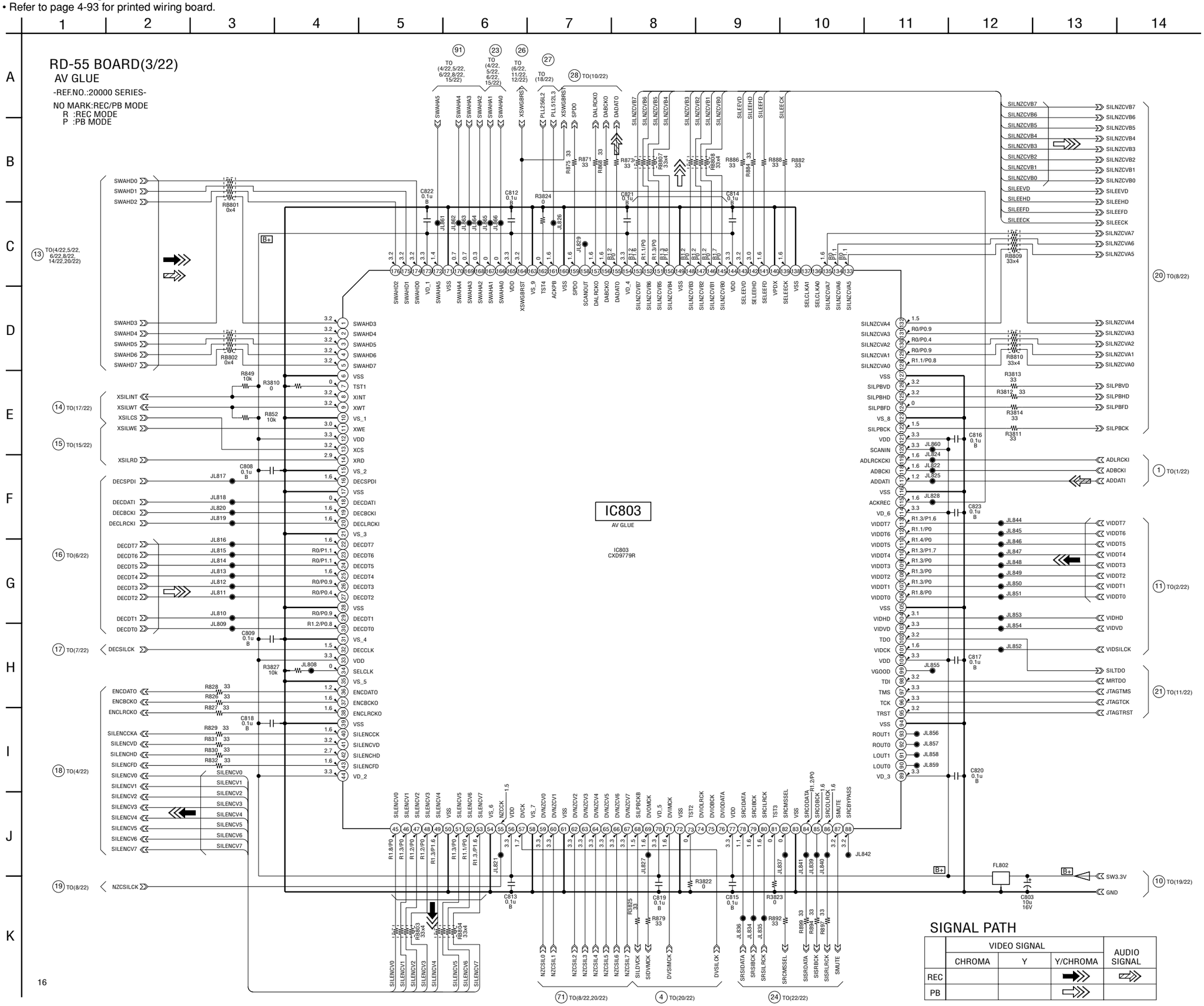


SIGNAL PATH

	VIDEO SIGNAL		
	CHROMA	Y	Y/CHROMA
REC	→	⇉	⇉
PB			

For Schematic Diagram

• Refer to page 4-93 for printed wiring board.



For Schematic Diagram

• Refer to page 4-93 for printed wiring board.

RD-55 BOARD(4/22)

AV ENCODER

-REF.NO.:20000 SERIES-

NO MARK:REC/PB MODE
R :REC MODE
P :PB MODE

IC901
AV ENCODER

IC901
UPD61052GD-LML-A

IC902
SDRAM

IC902
IC42S16400-7TG

IC903
SDRAM

IC903
IC42S16400-7TG

SIGNAL PATH

	VIDEO SIGNAL		
	CHROMA	Y	Y/CHROMA
REC			➡
PB			

For Schematic Diagram

• Refer to page 4-93 for printed wiring board.

RD-55 BOARD(5/22)
MR PROCESS
-REF.NO.:20000 SERIES-

NO MARK:REC/PB MODE
R :REC MODE
P :PB MODE

▲:Voltage measurement of the CSP IC and the Transistors with ▲ mark,is not possible.

IC1102
256Mbit SDRAM
IC1102
MT48LC16M16A2P-75-Y16Y

IC1101
MR PROCESS
IC1101
CXD9777GG

SIGNAL PATH

	VIDEO SIGNAL			AUDIO SIGNAL
	CHROMA	Y	Y/CHROMA	
REC			➡	⇨
PB			⇨	⇨

MR PROCESS
RD-55 (5/22)

For Schematic Diagram

• Refer to page 4-93 for printed wiring board.

RD-55 BOARD(6/22)

AV DECODER

-REF.NO.:20000 SERIES-

NO MARK:REC/PB MODE
R :REC MODE
P :PB MODE

IC1202

AV DECODER

IC1202
CXD1935Q

IC1201

IC1201
S-T111B18MC-OGDTFG

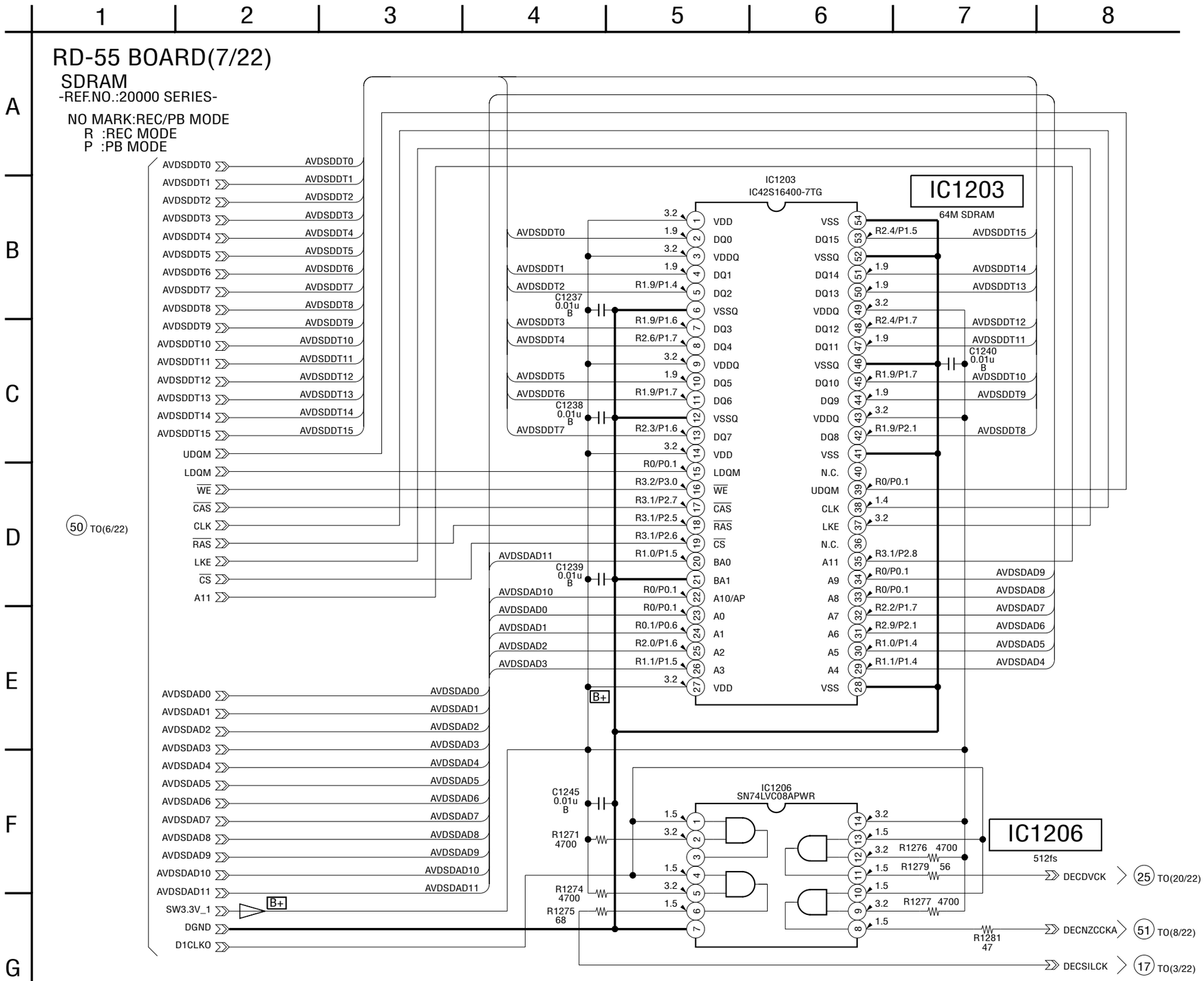
1.8V REG

SIGNAL PATH

	VIDEO SIGNAL			AUDIO SIGNAL
	CHROMA	Y	Y/CHROMA	
REC			➡	
PB			⇨	⇨

For Schematic Diagram

• Refer to page 4-93 for printed wiring board.



For Schematic Diagram

- Refer to page 4-93 for printed wiring board.
- Refer to page 4-5, 4-6 for waveforms.

RD-55 BOARD(8/22)
NAZCA
-REF.NO.:20000 SERIES-

NO MARK:REC/PB MODE

▲ :Voltage measurement of the CSP IC and the Transistors with ▲ mark,is not possible.

IC1306
V REF REG

IC1301
NAZCA

▲ IC1301
CXD4701GB

SIGNAL PATH

	VIDEO SIGNAL		
	CHROMA	Y	Y/CHROMA
REC			
PB	⇨	⇨	⇨

For Schematic Diagram

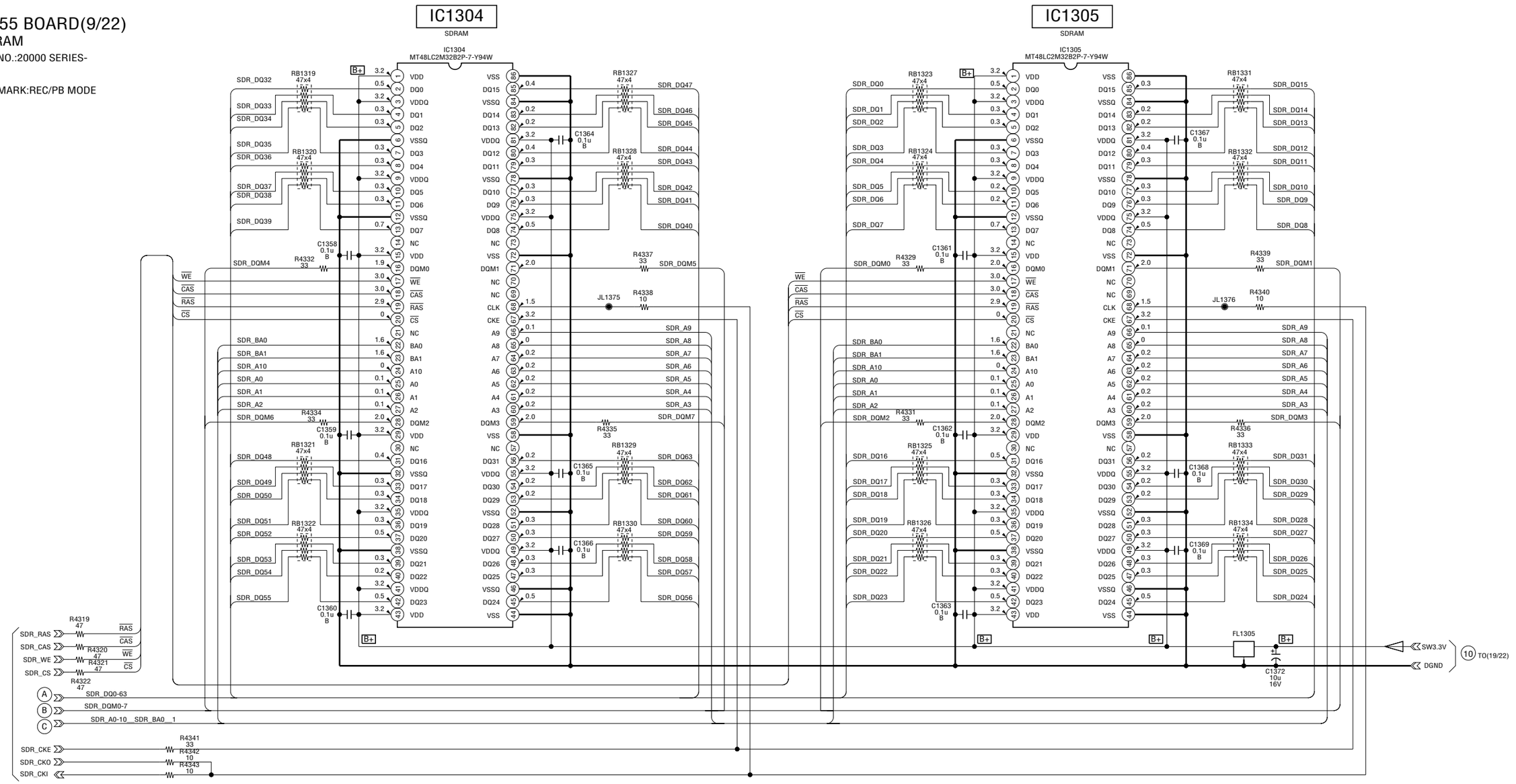
• Refer to page 4-93 for printed wiring board.

RD-55 BOARD(9/22)

SDRAM

-REF.NO.:20000 SERIES-

NO MARK:REC/PB MODE



For Schematic Diagram

• Refer to page 4-93 for printed wiring board.

RD-55 BOARD(10/22)

AUDY,DAC

-REF.NO.:20000 SERIES-

NO MARK:REC/PB MODE
R :REC MODE
P :PB MODE

SIGNAL PATH

	AUDIO SIGNAL
REC	⇒
PB	⇒

IC1601

2ch DAC

IC1601 AK4381VT-E2

XAMUTE → R1604 10k → XLMUTE

D1601 1SS355TE-17

PLL512L2 1.6 → 1 MCLK
DABCKO 1.6 → 2 BICK
1.2 → 3 SDTI
DALRCKO 1.6 → 4 LRCK
XSWGBRST → R1603 100 → 3.2 → 5 PDN
XDSRCS 3.2 → 6 CSN
SCIF2_SCK 3.2 → 7 CCLK
SCIF2_SDO 0 → 8 CDTI

18 DZFL 5.1
15 DZFR 5.1
14 VDD 5.1
13 VSS
12 AOUTL+ 2.5 → AOUTL+
11 AOUTL- 2.5 → AOUTL-
10 AOUTR+ 2.5 → AOUTR+
9 AOUTR- 2.5 → AOUTR-

SPDIFAO
B+ → A5V
AUGND

C1602 0.001u B
C1601 0.01u B
C1603 0.22u B
C1604 10u 16V

7 TO(1/22)

C1504 0.01u B
C1505 0.01u B

JL1505 JL1506 JL1507 JL1509 JL1510 JL1511 JL1512 JL1513 JL1514 JL1515 JL1516 JL1517

50 TEST1 1.6
49 SPDIFO
48 VSS
47 FLFRO 1.2
46 SLSRO
45 CSWO
44 DLDRO 3.3
43 VDD
42 VSS
41 DMLO
40 DMRO
39 VSS
38 DLO
37 DRO 3.3
36 VDD
35 DCO
34 DLFEO
33 DEXRO
32 DLSO
31 DRSO
30 VSS
29 A4 3.0 ← ADA4
28 A5 3.0 ← ADA5
27 A6 3.1 ← ADA6
26 A7 2.9 ← ADA7

B+

61 TO(11/22)

JTAGTRST → 51 TRST 3.2
JTAGTMS → 52 TMS 3.3
JTAGTCK → 53 TCK 3.3
AVDTDO → 54 TDI 3.3
AUDTDO ← 55 TDO 3.3
56 TEST2
SPDO → 57 SPDIFI 1.6
58 VSS
DALRCKO → 59 LRCKI 1.6
DABCKO → 60 BCKI 1.6
61 VDD 3.3
62 VSS
XSWGBRST → 63 DLDRI
64 CSWI
65 SLSRI
DADATO → R1507 0 → 66 FLFRI
67 TEST3
62 TO(18/22) PLL512L4 → 68 CLK512 1.7
PLL512L2 → C1501 0.01u B → 69 VSS
R1508 100 → 70 XRST 3.2
SCIF2_SCK → 71 VDD 3.3
SCIF2_SCK → 72 SCLK 3.2
SCIF2_SDO → 73 XCS 3.2
SCIF2_SDO ← 74 SI 0
63 TO(12/22) SCIF2_SDI ← 75 SO 0.2
XDSRCS → XDSRCS
XAMUTE → XAMUTE
XAUDCS →

92 TO(22/22)
XDSRCS → XDSRCS
SCIF2_SCK → SCIF2_SCK
SCIF2_SDO → SCIF2_SDO
SCIF2_SDI → SCIF2_SDI

76 DEXRI
77 DMLI
78 DMRI
79 VSS
80 PHRI
81 BCKAI
82 DQM
83 DLI
84 DRI
85 DCI
86 DLFEI
87 DLSI
88 DRSI
89 VSS
90 D15 2.4 → ADD15
91 D14 2.4 → ADD14
92 D13 2.0 → ADD13
93 D12 2.0 → ADD12
94 D11 2.2 → ADD11
95 D10 2.2 → ADD10
96 VDD 3.3
97 D9 2.0 → ADD9
98 D8 2.4 → ADD8
99 GND
100 D0 2.1 → ADD0

C1502 0.01u B
C1503 0.01u B
JL1508
C1506 0.01u B
C1510 10u 16V

B+

IC1501

AUDY

IC1501
CXD9722ATQ

A8 25 2.8 → ADA8
A9 24 2.8 → ADA9
VSS 23
A3 22 3.0 → ADA3
A2 21 3.0 → ADA2
A1 20 3.0 → ADA1
A0 19 2.8 → ADA0
A10 18 3.2 → ADA10
A11 17 3.0 → ADA11
VDD 16 3.3 → C1508 0.01u B
CKE 15 3.3 → ADCKE
CLK 14 1.6 → R1512 0 → ADCLK
CS 13 2.9 → XADCS
RAS 12 3.1 → XADRAS
CAS 11 3.1 → XADCAS
WE 10 3.2 → XADWES
VSS 9
D7 8 2.2 → ADD7
D6 7 2.2 → ADD6
VDD 6 3.3 → C1509 0.01u B
D5 5 2.2 → ADD5
D4 4 2.2 → ADD4
D3 3 2.2 → ADD3
D2 2 2.2 → ADD2
D1 1 2.2 → ADD1

B+

IC1502

16M SDRAM

IC1502
IC42S16100-7TG (T&R)

C1511 0.01u B
C1512 0.01u B
C1513 0.01u B
C1514 0.01u B

1 VCC 3.2
2 DQ0 2.1 ← ADD0
3 DQ1 2.1 ← ADD1
4 VSSQ
5 DQ2 2.1 ← ADD2
6 DQ3 2.1 ← ADD3
7 VCCQ 3.2
8 DQ4 2.1 ← ADD4
9 DQ5 2.1 ← ADD5
10 VSSQ
11 DQ6 2.1 ← ADD6
12 DQ7 2.1 ← ADD7
13 VCCQ 3.2
14 DQML
15 WE 3.1 ← XADWES
16 CAS 3.0 ← XADCAS
17 RAS 3.0 ← XADRAS
18 CS 2.9 ← XADCS
19 A11(BA) 2.9 ← ADA11
20 A10/AP 3.1 ← ADA10
21 A0 2.7 ← ADA0
22 A1 2.9 ← ADA1
23 A2 2.9 ← ADA2
24 A3 2.9 ← ADA3
25 VCC 3.2

50 VSS
49 DQ15 1.9 → ADD15
48 DQ14 1.9 → ADD14
47 VSSQ
46 DQ13 2.4 → ADD13
45 DQ12 2.4 → ADD12
44 VCCQ 3.2
43 DQ11 2.2 → ADD11
42 DQ10 2.2 → ADD10
41 VSSQ
40 DQ9 2.4 → ADD9
39 DQ8 1.9 → ADD8
38 VCCQ 3.2
37 N.C.
36 DQMU
35 CLK 1.6 → ADCLK
34 CKE 3.2 → ADCKE
33 N.C.
32 A9 2.8 → ADA9
31 A8 2.7 → ADA8
30 A7 2.9 → ADA7
29 A6 3.0 → ADA6
28 A5 2.9 → ADA5
27 A4 3.0 → ADA4
26 VSS

DGND
10 TO(19/22)
B+ → SW3.3V

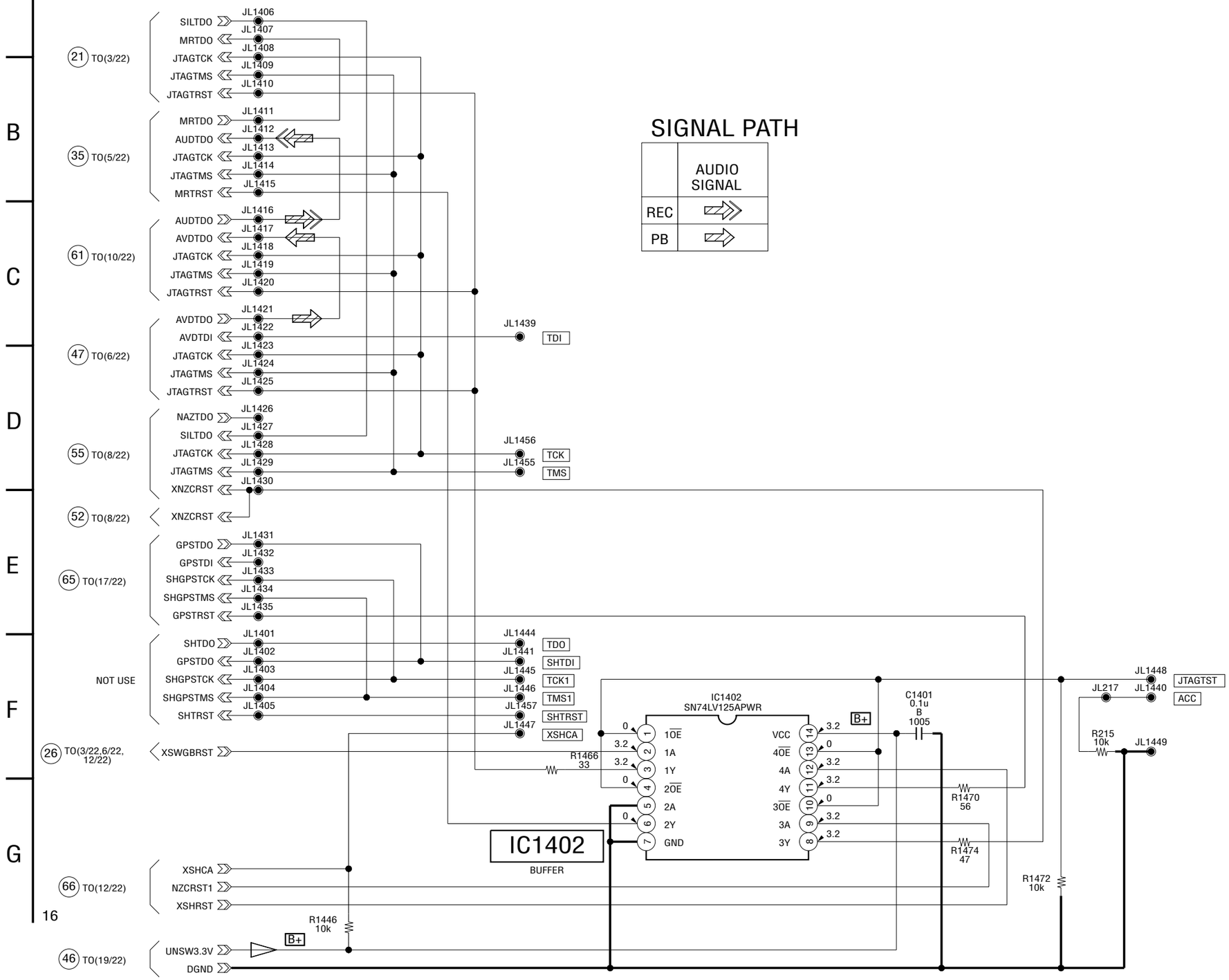
For Schematic Diagram
• Refer to page 4-93 for printed wiring board.

RD-55 BOARD(11/22)

NO MARK:REC/PB MODE

JTAG

-REF.NO.:20000 SERIES-



For Schematic Diagram

- Refer to page 4-93 for printed wiring board.
- Refer to page 4-5, 4-6 for waveforms.

RD-55 BOARD(12/22)
SH
-REF.NO.:20000 SERIES-

▲:Voltage measurement of the CSP IC and the Transistors with ▲ mark,is not possible.

NO MARK:REC/PB MODE

IC111
EEP ROM
IC111
BR24L32FJ-WE2

IC104
BUFFER
SN74LVC541APWR

IC103
SH
▲ IC103
HD64173068L200V

IC112
BUFFER
SN74ACT08PWR

For Schematic Diagram

• Refer to page 4-93 for printed wiring board.

RD-55 BOARD(13/22)

SDRAM,NAND FLASH

-REF.NO.:20000 SERIES-

NO MARK:REC/PB MODE
R :REC MODE
P :PB MODE

IC108
256M SDRAM

IC108
MT48LC16M16A2P-75-Y16Y

IC109
MT48LC16M16A2P-75-Y16Y

IC109
256M SDRAM

IC402
256M NAND FLASH

IC402
K9F2808U0C-PCB0T

IC401
SWITCH

IC401
TC7WH157FK(TE85R)

IC106
66fs CLOCK

IC106
CDCVF2505PWR

74 TO(12/22, 15/22)
76 TO(12/22, 14/22)
77 TO(12/22, 15/22)
78 TO(12/22)
79 TO(12/22)
80 TO(17/22)

CPUCK66

SDRAM,NAND FLASH
RD-55 (13/22)

For Schematic Diagram

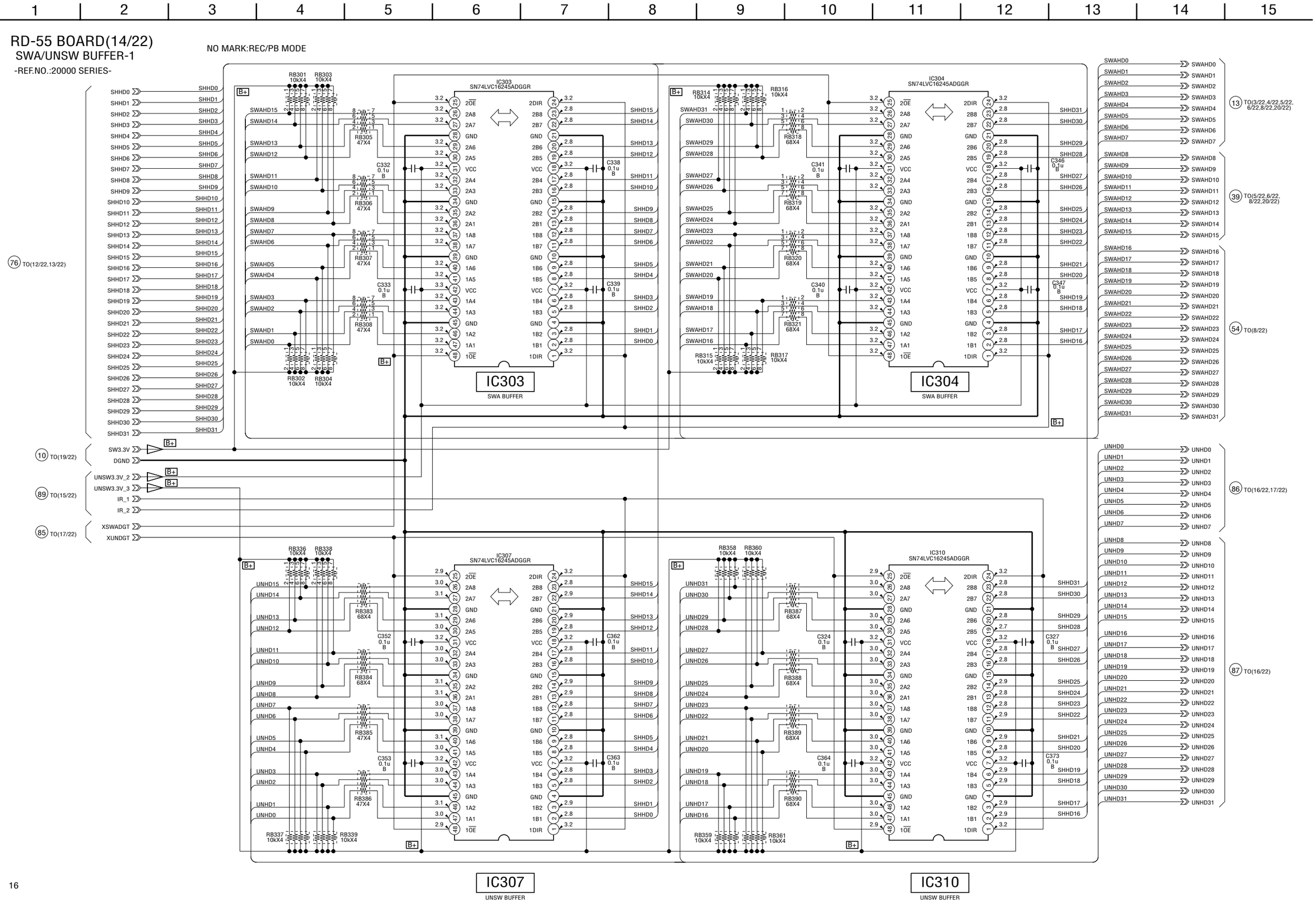
• Refer to page 4-93 for printed wiring board.

RD-55 BOARD(14/22)

SWA/UNSW BUFFER-1

-REF.NO.:20000 SERIES-

NO MARK:REC/PB MODE



For Schematic Diagram

• Refer to page 4-93 for printed wiring board.

RD-55 BOARD(15/22)

SWA/UNSW BUFFER-2

-REF.NO.:20000 SERIES-

NO MARK:REC/PB MODE
R :REC MODE
P :PB MODE

IC301 SN74LVC16244ADGGR — SWA BUFFER

IC305 SN74LVC16244ADGGR — SWA BUFFER

IC308 SN74LVC16244ADGGR — UNSW BUFFER

IC302 SN74LVC16244ADGGR — SWA BUFFER

IC306 SN74LVC16244ADGGR — UNSW BUFFER

IC309 SN74LVC16244ADGGR — UNSW BUFFER

SWA/UNSW BUFFER-2
RD-55 (15/22)

For Schematic Diagram

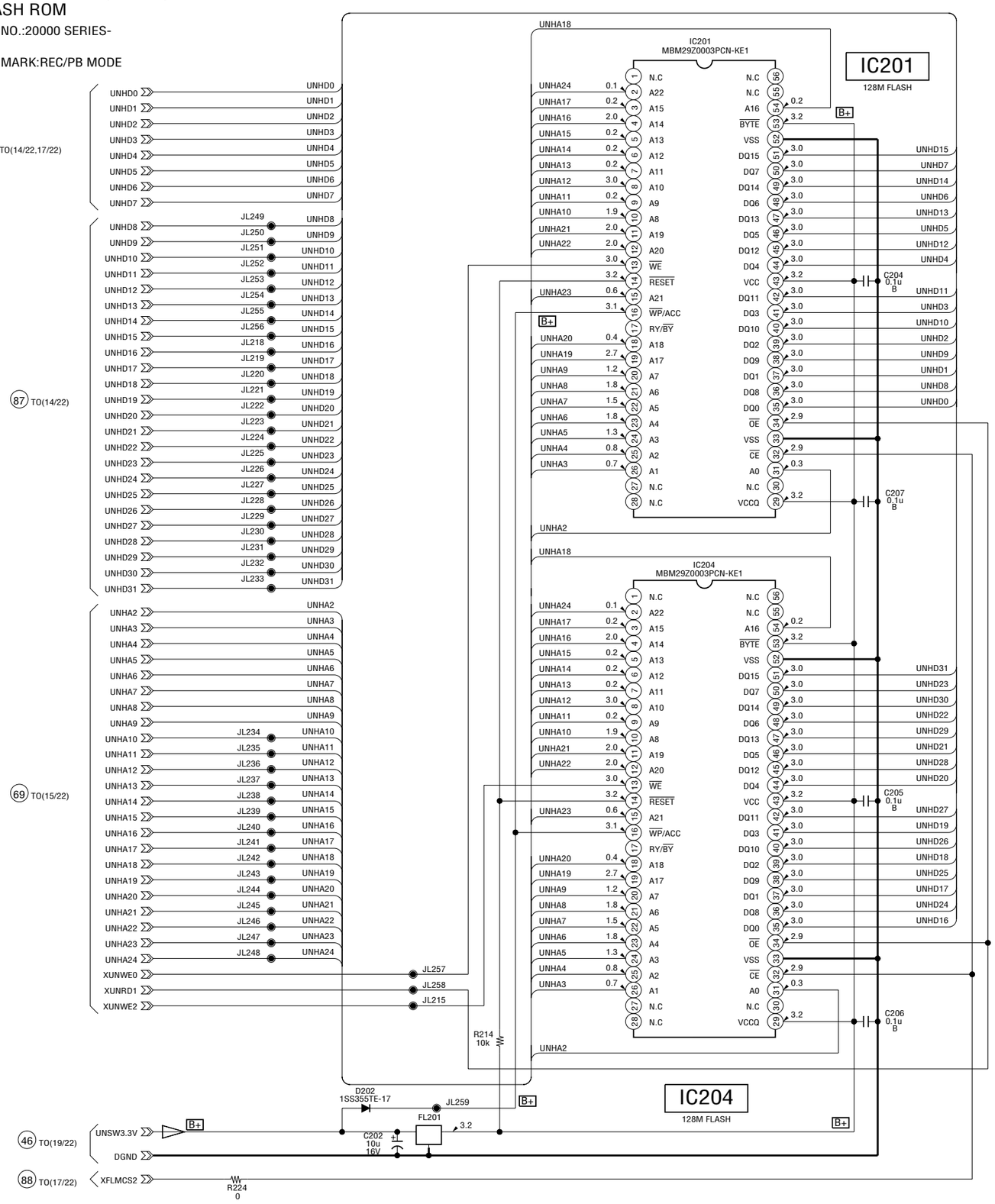
• Refer to page 4-93 for printed wiring board.

RD-55 BOARD(16/22)

FLASH ROM

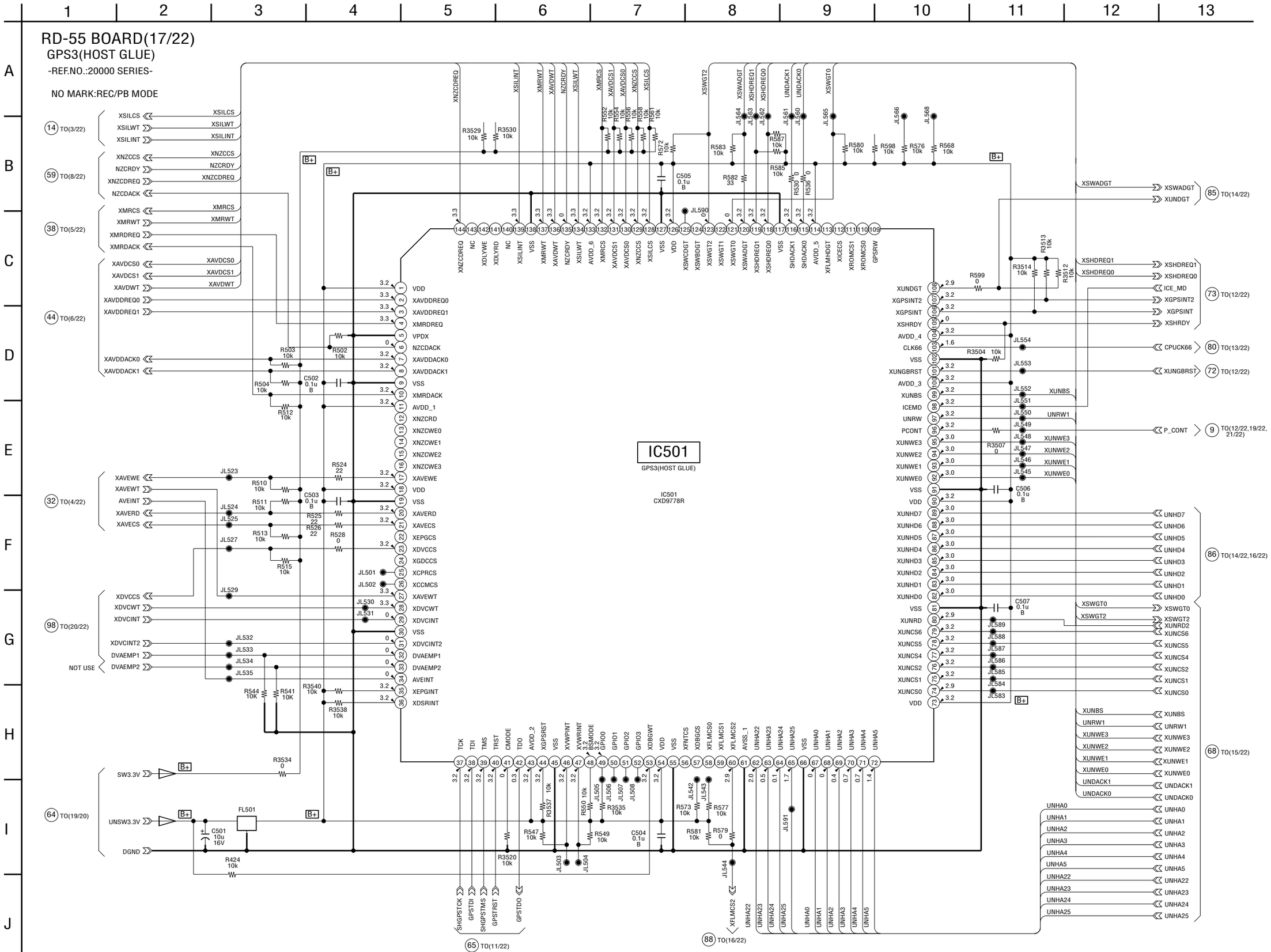
-REF.NO.:20000 SERIES-

NO MARK:REC/PB MODE

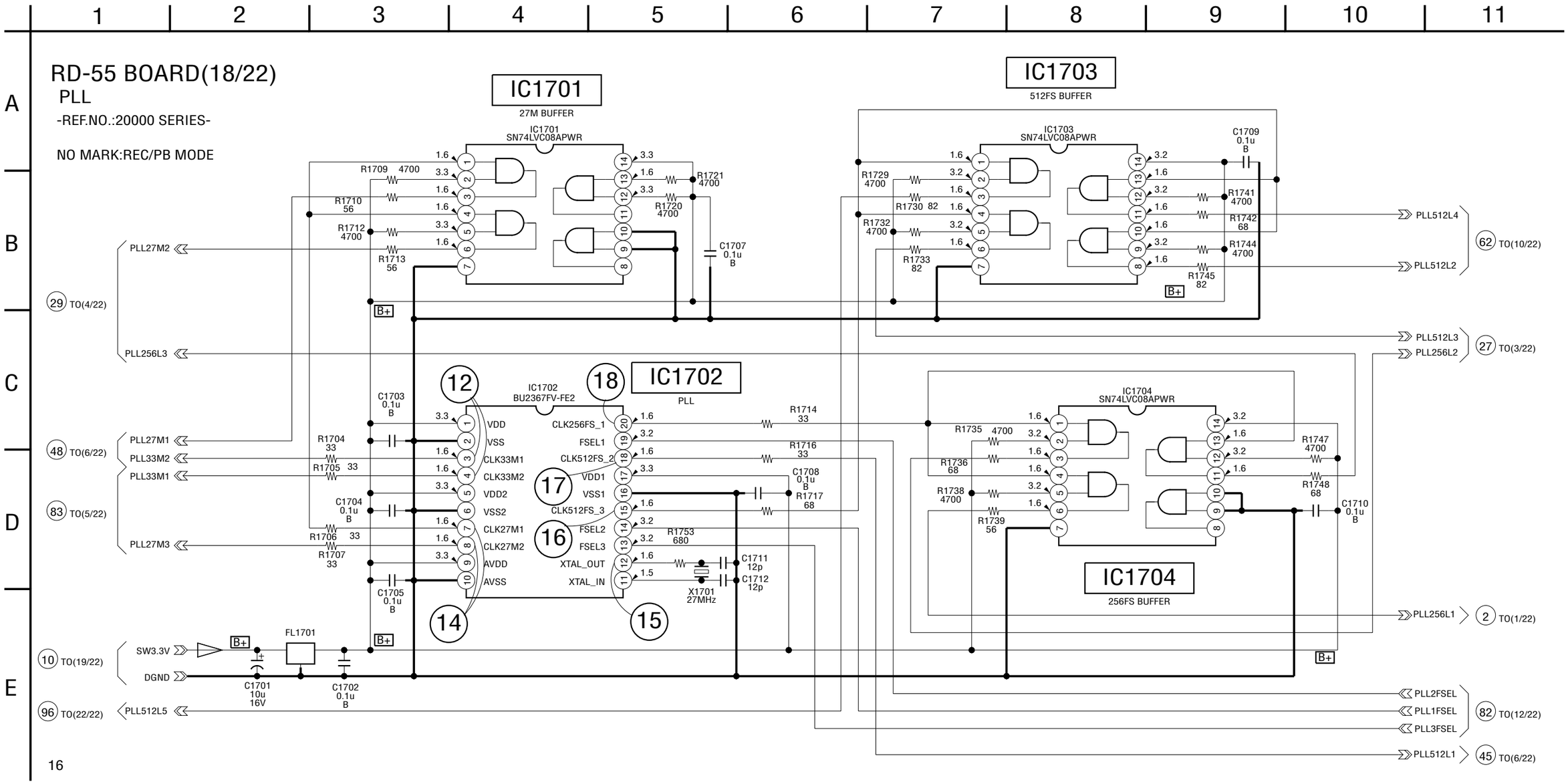


For Schematic Diagram

• Refer to page 4-93 for printed wiring board.



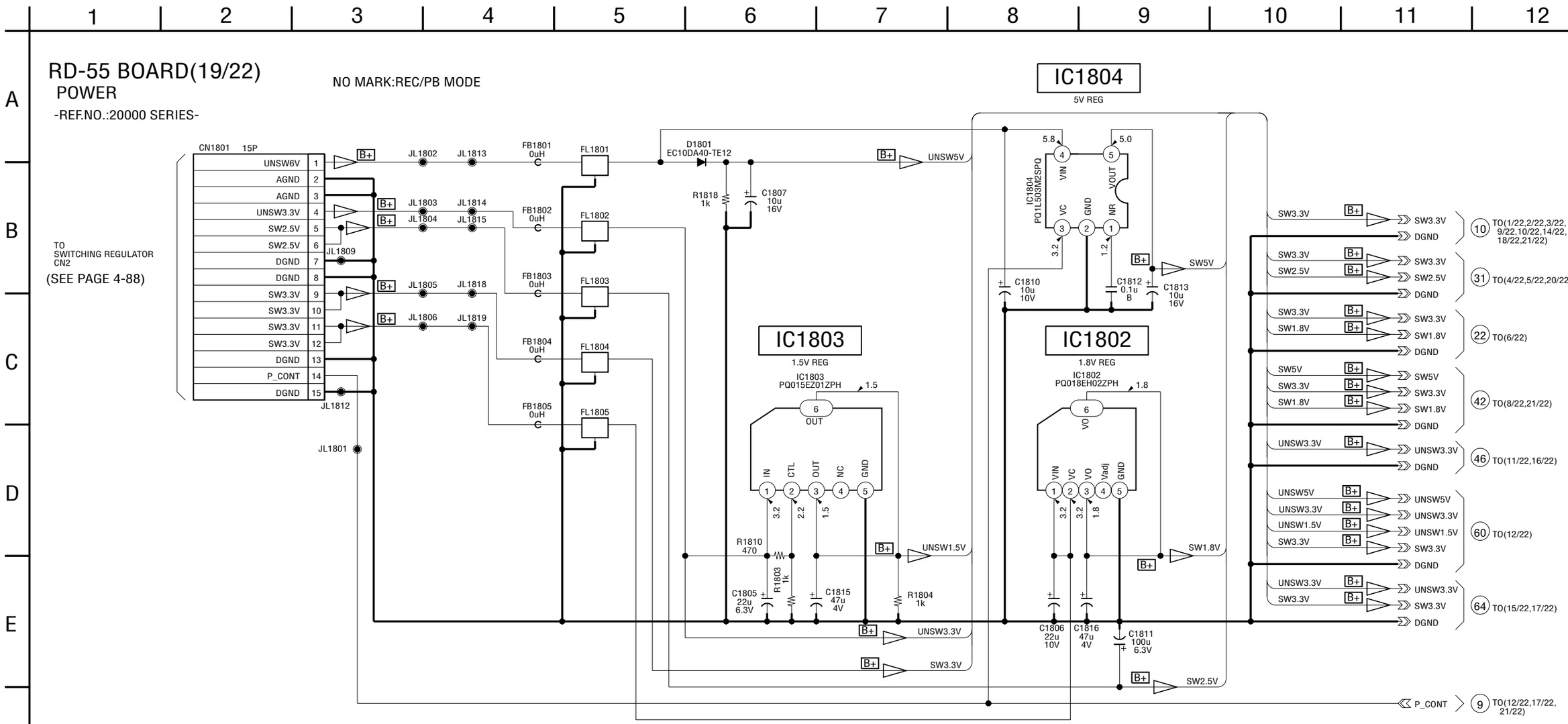
For Schematic Diagram
• Refer to page 4-93 for printed wiring board.
• Refer to page 4-5, 4-6 for waveforms.



For Schematic Diagram
• Refer to page 4-93 for printed wiring board.

RD-55 BOARD(19/22)
POWER
-REF.NO.:20000 SERIES-

NO MARK:REC/PB MODE



For Schematic Diagram
• Refer to page 4-93 for printed wiring board.
• Refer to page 4-5, 4-6 for waveforms.

RD-55 BOARD(20/22)
DV PROCESS
-REF.NO.:20000 SERIES-

NO MARK:REC/PB MODE
R :REC MODE
P :PB MODE

SIGNAL PATH

	VIDEO SIGNAL			AUDIO SIGNAL
	CHROMA	Y	Y/CHROMA	
REC			⇉	⇉
PB			⇉	⇉

IC2102
DV PROCESS
IC2102
UPD72893BGD-LML-A

IC2103
16M SDRAM

IC2105
INVERTER

IC2106
PLL

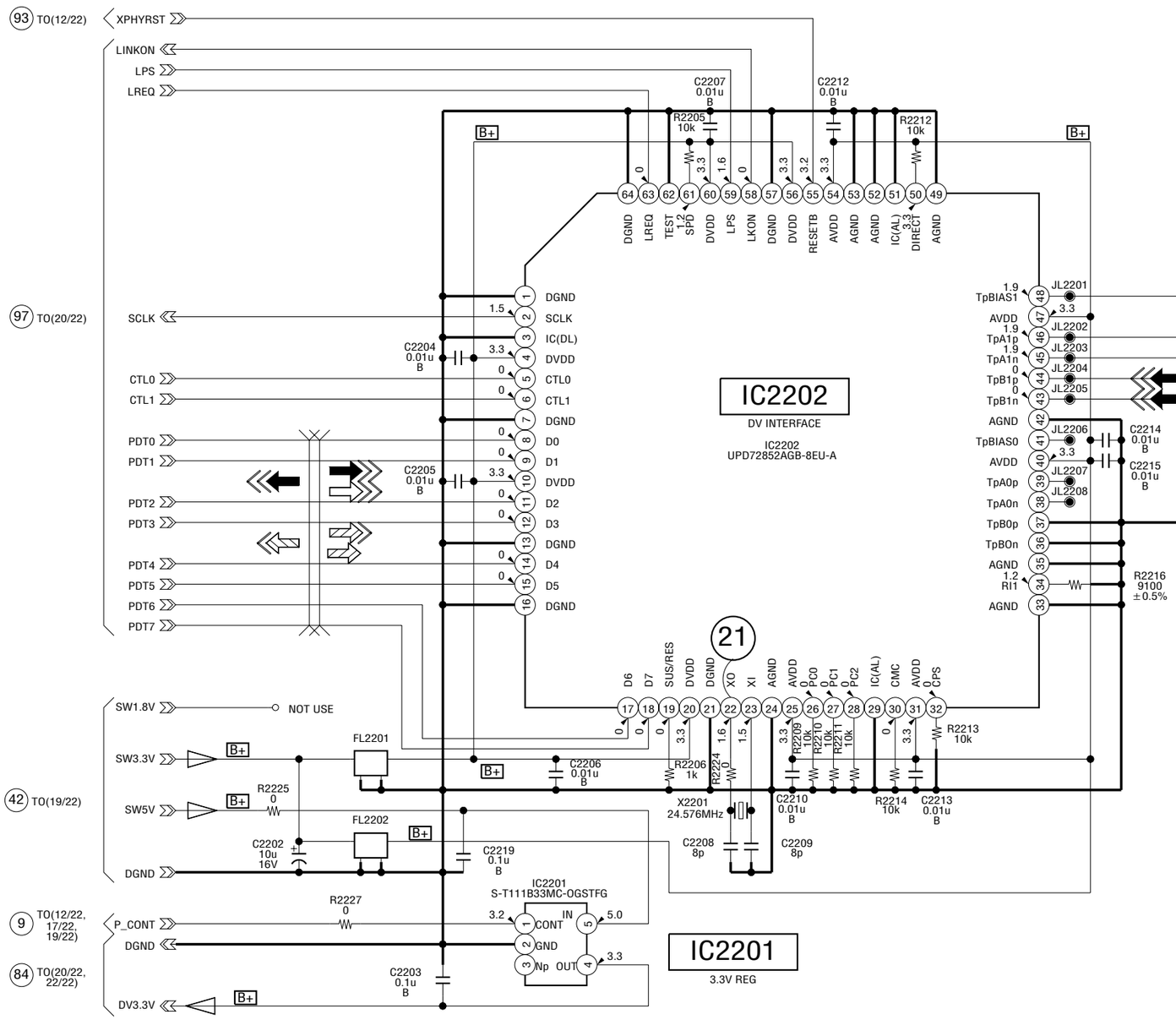
For Schematic Diagram
- Refer to page 4-93 for printed wiring board.
- Refer to page 4-5, 4-6 for waveforms.

RD-55 BOARD(21/22)

DV INTERFACE

-REF.NO.:20000 SERIES-

NO MARK:REC/PB MODE

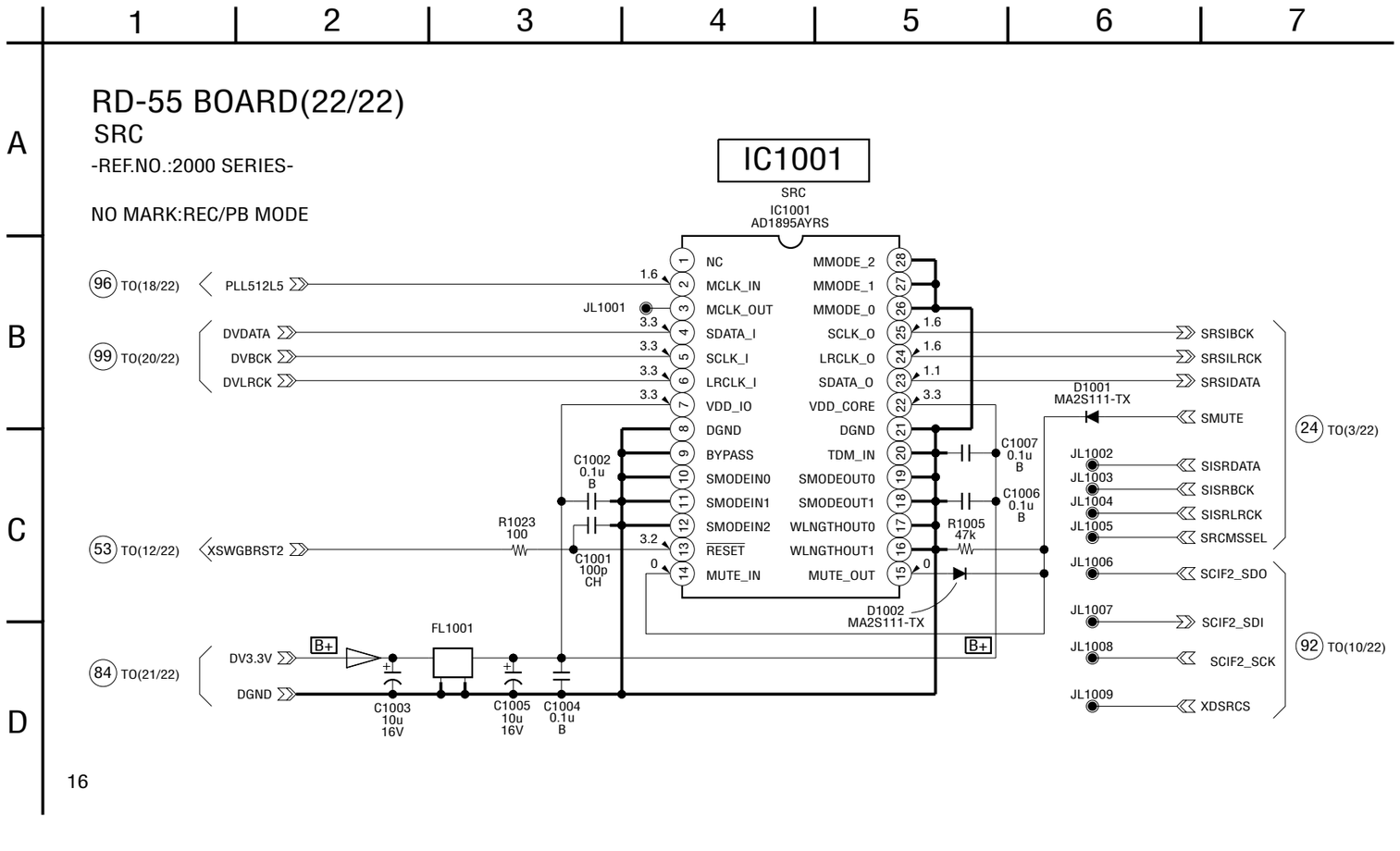


SIGNAL PATH

	VIDEO SIGNAL			AUDIO SIGNAL
	CHROMA	Y	Y/CHROMA	
REC			➡	⇨
PB			⇨	⇨

For Schematic Diagram

• Refer to page 4-93 for printed wiring board.

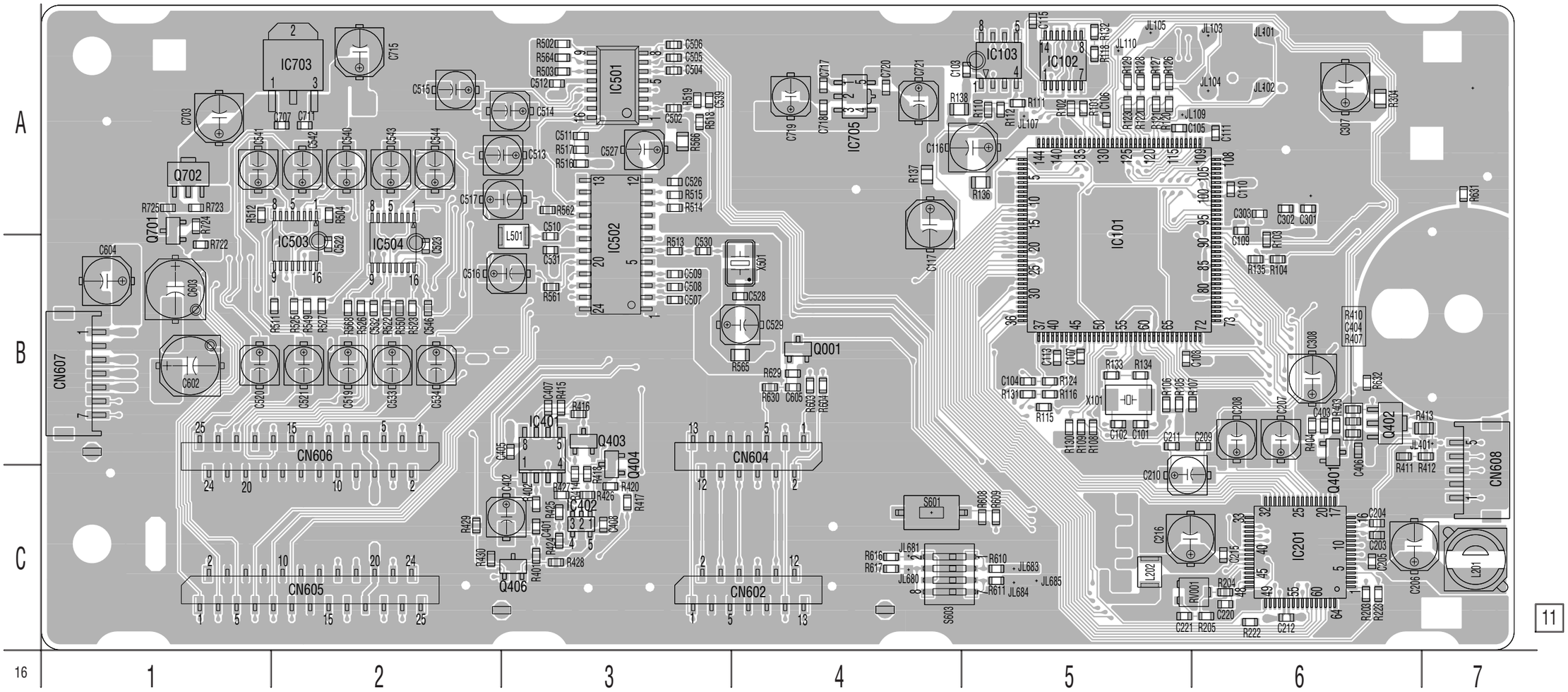


SRC
RD-55 (22/22)

4-3. PRINTED WIRING BOARDS

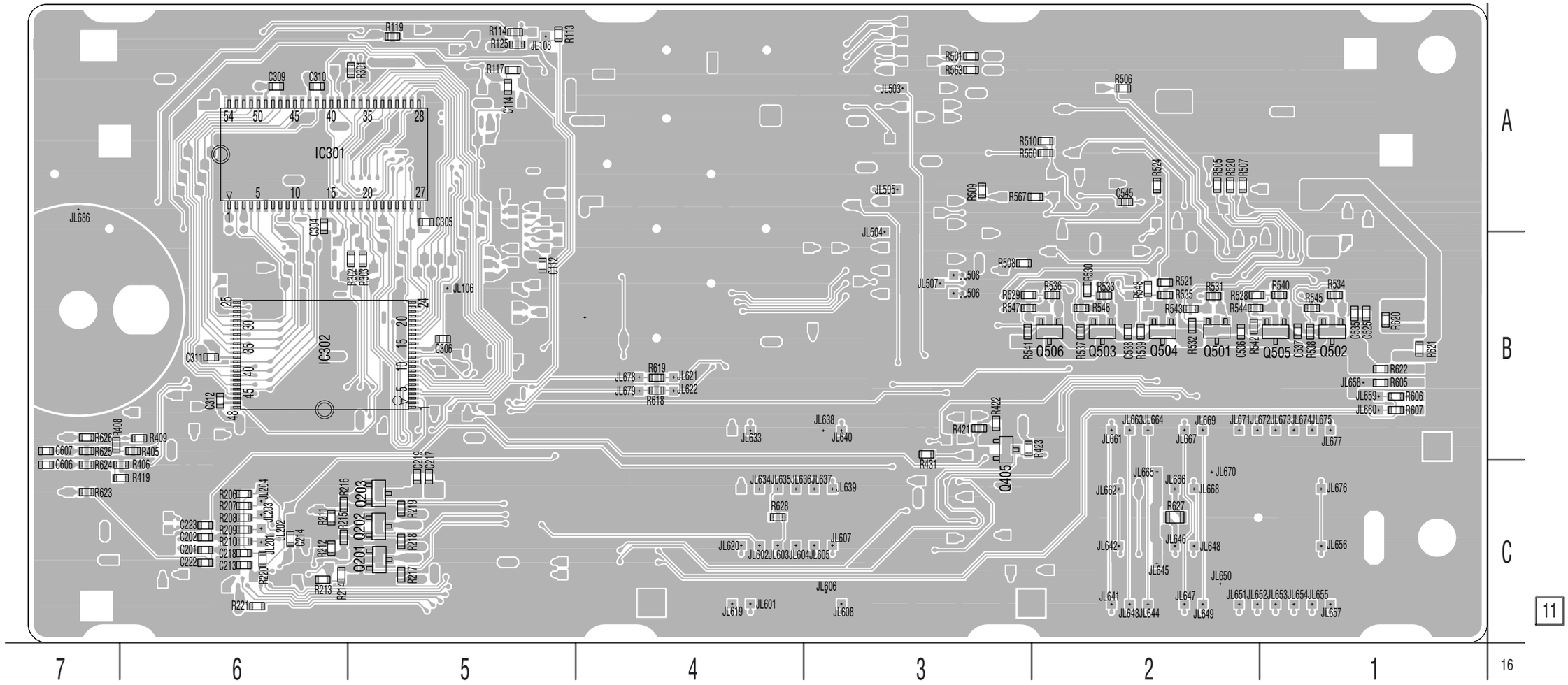
EPG-001 BOARD(SIDE A)

• : Uses unleaded solder.



EPG-001 BOARD(SIDE B)

• : Uses unleaded solder.

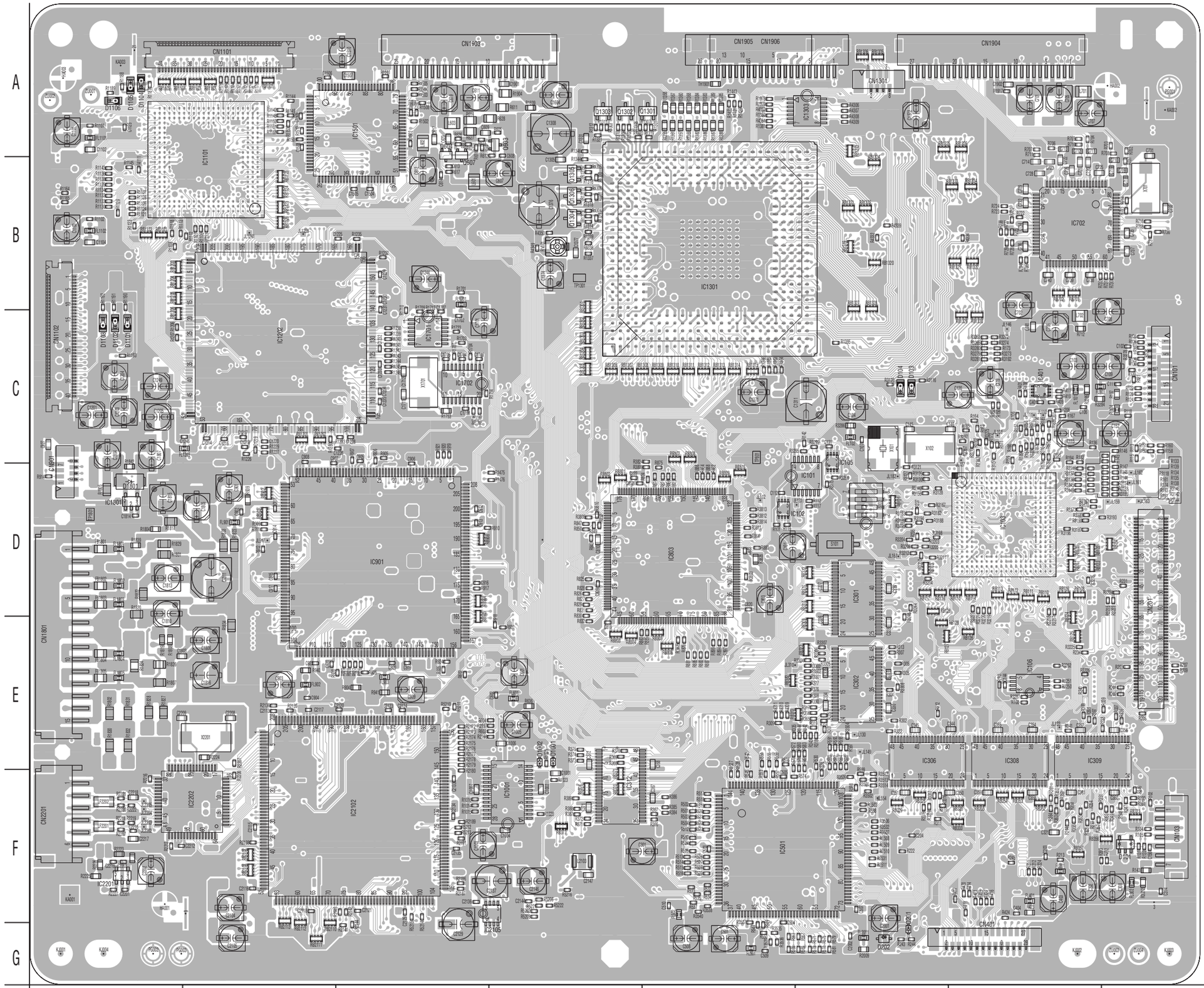


CONNECTOR, POWER, RGB ENCODER, ROTA IC, GS, FLASH, SDRAM, G LINK,VIDEO SYNC SEPARATOR

EPG-001

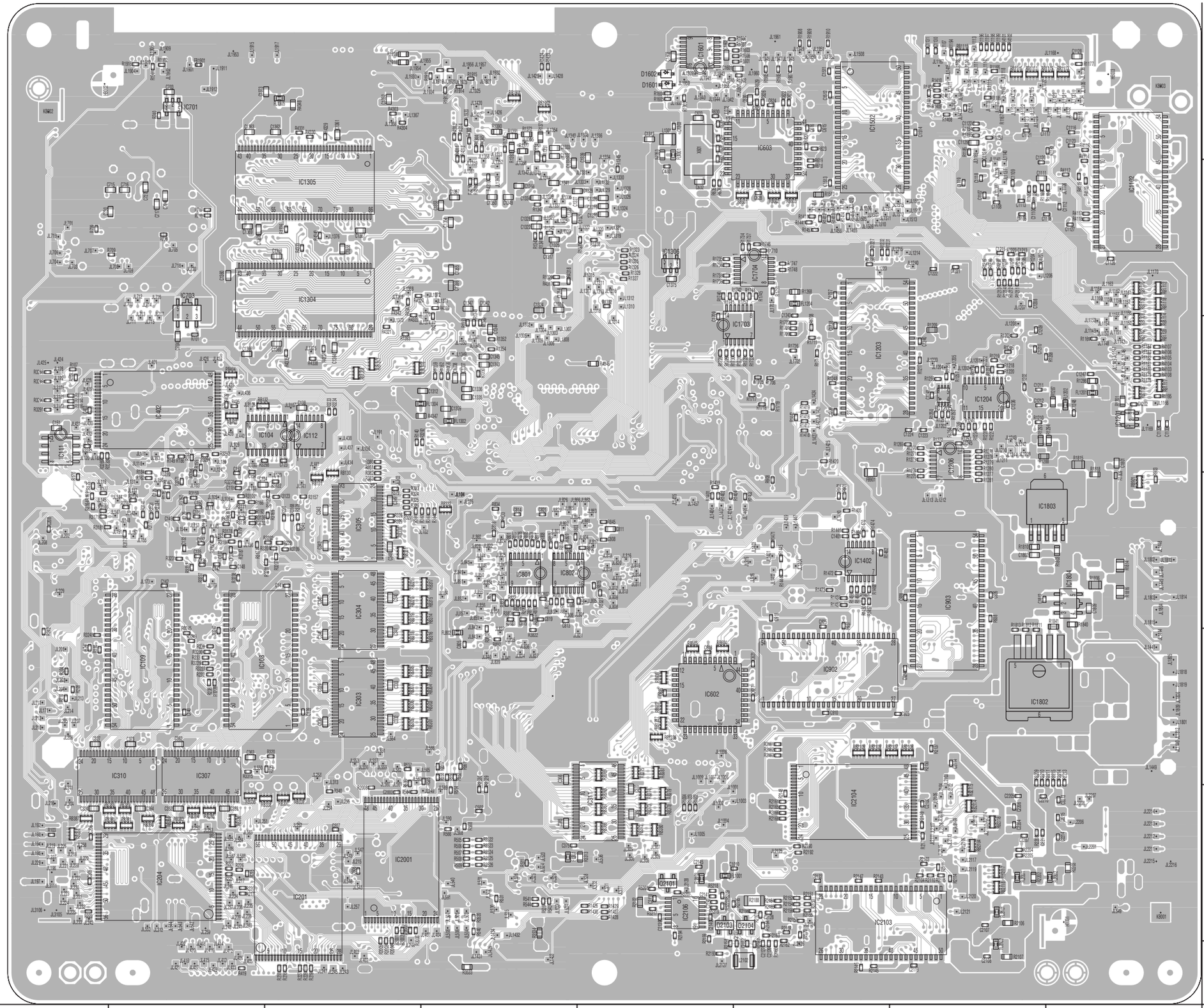
RD-055 BOARD(SIDE A)

• : Uses unleaded solder.



RD-055 BOARD(SIDE B)

• : Uses unleaded solder.



MEMO

SECTION 5
IC PIN FUNCTION DESCRIPTION

5-1. IT CONTROL IC (IC603: M603H2MC-511FPUO (AV-84 BOARD))

Pin No.	Pin Name	I/O	Function
1	TU_S/B_D	I	Tuner Stereo detection L: Stereo
2	SIRCS IN	I	Remote control signal input
3	JUSTCLK	I	Timer pulse input Fixed to digital GND
4	AV_LINK_IN	I	Not used
5	CSYNC	I	Composite sync signal input
6	FAN_DET	I	Fan rotation control at power ON, L: Fan rotating, H: Fan stopped
7	BYTE	–	Fixed to digital GND
8	CNVSS		Connected to VCC when the FLASH is overwritten
9	XCIN	I	32KHz oscillator input
10	XCOUT	O	32KHz oscillator output
11	XRESET	I	Reset signal input
12	XOUT	O	10 MHz oscillator output
13	VSS	–	Digital GND
14	XIN	I	10 MHz oscillator input
15	VCC	–	Analog power 6 V
16	XNMI	I	Analog power 6 V
17	SYNC_V	I	V sync signal detection
18	IT_REQ	I	Signal input for communication request from HOSTIC
19	SLICEON_IN	I	Signal input during slicer operation
20	N.C.	O	Fixed to digital GND
21	LED DIMMER	O	Signal output for LED dimmer pulse
22	AREA1	I	Destination input 1
23	BUZZER	O	Fixed to digital GND
24	N.C.	–	Fixed to digital GND
25	STB_CNT	–	Fixed to digital GND
26	AREA0	I	Destination input 0
27	AV_LINK_OUT	O	Fixed to digital GND
28	TXT_SCL	–	Fixed to digital GND
29	TXT_SDA	–	Fixed to digital GND
30	VSS2	–	Fixed to digital GND
31	LP2	O	Filter signal output 1 (For Fsc)
32	LP3	–	Filter signal output
33	LP4	O	Filter signal output 1 (For PDC)
34	VDD2	–	Backup power 5 V
35	M2	–	
36	M1	–	Fixed to digital GND
37	SLICEON	O	Slicer operation detection H: Operating
38	ITSOUT	O	Data signal output (HOST / overwriting FLASH by dedicated writer)
39	ITSIN	I	Data signal input (HOST / overwriting FLASH by dedicated writer)
40	ITSCLK	O	Clock signal output for host communication
41	H/B	I	DVD/HDD judge signal input
42	FLD_DATA	O	SO signal output for FLD
43	FLD_IN	I	Fixed to digital GND
44	FLD_CLK	O	SCLK signal output for FLD
45	EPG SW1	–	
46	EPG SW2	–	
47	LED_STB	O	Strobe signal output for FLD drive
48	FL_PCONT	O	Power control signal output of D/DCONV for FLD H: ON, L: OFF
49	FLD_XRESET	O	Reset signal output for FLD drive H: NORMAL, L: RESET
50	FLD_CS	O	Chip select signal output for FLD drive

Pin No.	Pin Name	I/O	Function
51	TXT_EN	O	
52	SYNC_C_SW	O	Fixed to digital GND
53	SYNC_S/V_SW	O	LIS/V switching signal while waiting for synchronized recording Analog power 6 V
54	TU_FMONO	O	Forced monaural signal output / clock adjustment 1 KHz output
55	RESET_5V	O	RESET 5 V signal output
56	IT_XRESET	O	Reset signal output to HOST (SH)
57	TU_SCL	O	IIC clock output for tuner
58	TU_SDA	I/O	IIC data input/output for tuner
59	EEP_XWP	O	EEPROM write-protect output L: Write-protected
60	EEP_SCL	O	IIC clock output for EEPROM
61	EEP_SDA	I/O	IIC data input/output for EEPROM
62	XMENTMUTE	–	
63	N.C.	–	Fixed to digital GND
64	BS_BIT_SW	I	BSBIT output terminal cable presence/absence detection Fixed to digital GND
65	BS_DEC_SW	–	Decoder connection detection H: DVD, L: Tuner Fixed to digital GND
66	BS_COR_DET	I	BSCOR detection Fixed to digital GND
67	BS_VOL_DET	I	BSVOL detection Fixed to digital GND
68	BS_CONV_CONT	O	BSCONV control Fixed to digital GND
69	VCC	–	Connect to 6 V power Fixed to digital GND
70	BS_BST_CONT	O	Fixed to digital GND
71	VSS	–	Digital GND
72	H_DET	I	H sync detection H: INSEL, L: With output video signal
73	DSEL	O	D terminal output progressive / interlace switching Fixed to digital GND
74	SYNC_POW	O	Sync detection circuit power control
75	YC_SEP_ON	O	S terminal/composite input detection H: Composite, L: S-video
76	S2SW	I	Front L2S Input detection
77	SYNCRO_DET	O	Sync detection output
78	XP_MUTE	O	
79	MAIN/SAP	O	Tuner selection output H: SAP, L: MAIN
80	ERINT	I	
81	N.C.	–	Fixed to digital GND
82	P_FAIL	I	Power failure monitor detection input
83	SAP_DET	O	Tuner Bilingual output L: Bilingual
84	AUTO_PRESET	O	Tuner auto preset output H: Auto preset
85	TA_MUTE	O	Tuner audio mute signal output
86	TU_PCONT	O	Tuner output control
87	TU_V_DET	I	Tuner V sync detection
88	INSEL1	O	Input switching (Fixed to Line1 input)
89	INSEL2	O	Input switching (Fixed to Line1 input)
90	INSEL_TU	O	Input switching (Fixed to Line1 input)
91	FAN_SPEED	O	Fan high speed rotation detection H: Initial rotation, L: Low speed rotation
92	FAN_ONOFF	O	Fan ON/OFF signal output H: ON, L: OFF
93	N.C.	–	Fixed to digital GND
94	N.C.	–	Fixed to digital GND
95	WIDE	O	D terminal aspect output (Set to 4 : 3)
96	OND0	I	Drive temperature detection input
97	KEY1	I	AD key input 1
98	KEY2	I	AD key input 2
99	KEY3	I	AD key input 3
100	KEY4	I	AD key input 4

Pin No.	Pin Name	I/O	Function
101	KEY5	–	Not used
102	BS_C/N_DET	I	BSC / N detection (MAX: 2.9 V normal signal: 2.2 V)
103	AVSS	–	Analog GND
104	TU_GAIN_MAX	I	Tuner AGC input
105	VREF	–	Analog power 5 V
106	AVCC	–	Analog power 6 V
107	INSEL_C	–	Not used
108	VDD1	–	Digital power 6 V
109	SYNCIN	I	Sync signal detection input
110	SVREF	I	Sync signal slice reference potential input
111	VSS1	–	Digital GND
112	VDD3	–	Analog power 5 V
113	CVIN1	I	Component video signal input
114	VSS3	–	Analog GND
115	FSCIN	I	Fsc input
116	TU_AFT	I	Tuner AFT input

MEMO

SECTION 6
SERVICE MODE

This is the diagnostics to define the faulty position.
The diagnostics can be executed using the remote commander (Remote Control Mode 3) and monitor.
To execute the service mode, connect the VIDEO OUT (L2 OUT) connector to the monitor.
Connect the AC power cord to the power outlet.
A message, “WELCOME” appears on the display panel of the main unit.
Keep holding down the “REC PAUSE”, “SYSTEM MENU” and “TOOLS” keys, of the main unit (about 10 seconds) until the screen appears on the monitor display.
Either “OK” or “NG” appears on the monitor screen while the diagnostics is in progress.
You can judge the respective device or its peripheral from the message of either “OK” or “NG” on the monitor screen.
When an abnormality is detected, the diagnostics is stopped at that moment and you can select to proceed the diagnostics or to stop it.
Use the keys on the front panel of the main unit to operate the diagnostics.

6-1. Checking Item

Checking item	IC name	REF
GPS 3	IC CXD9778R	IC501
NAZCA	IC CXD4701GB	IC1301
AUDY	IC CXD9722ATQ	IC1501
SILVIA	IC CXD9779R	IC803
VIDEO DEC	IC TVP 5147 (U/C)	
AV ENC	IC UPD61052GD	IC901
MR	IC CXD9777GG	IC1101
AV DEC	IC CXD1935Q	IC1202
EEPROM	IC CAT24WC32W	IC111
NAND FLASH	IC K9F2808U0C	IC402
DV	IC UPD728938BGD	IC2102

All parts are mounted on the RD-55 assembly board.

Note: Do not execute 4) NAND Factory Setup in the 3)TEST MODE menu. (This item is dedicated for Factory use.)
Otherwise, the memory data is deleted and the setting cannot be recovered.

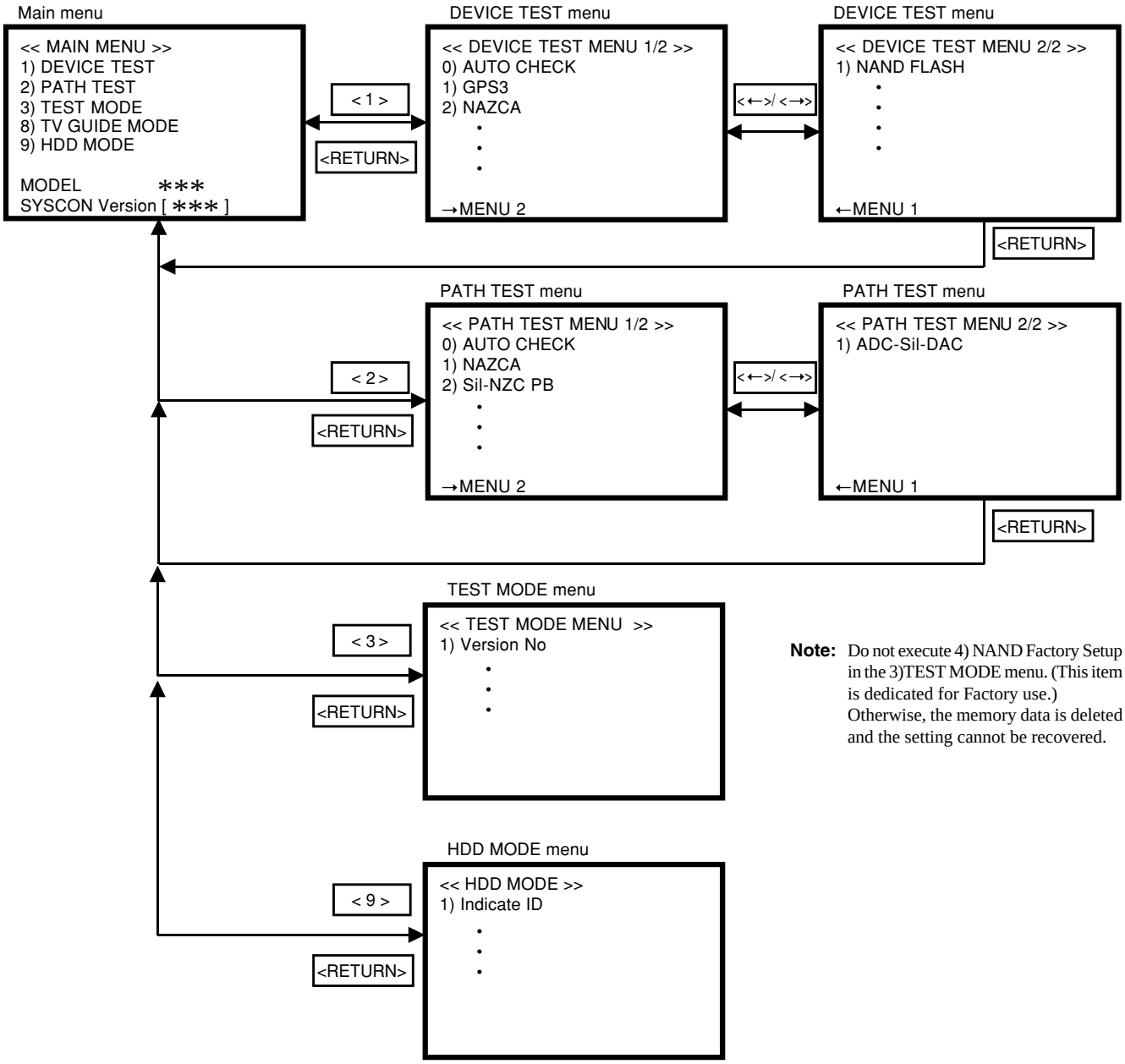
Checking item	IC name	REF
NAND FLASH	MX29LV160BBTC-90G	IC302

A part is mounted on the EPG-001 assembly board.

Note: Do not execute 3) Reset Guide Slave Board in the 8)TV GUIDE MODE menu. (This item is dedicated for Factory use.)
Otherwise, the memory data is deleted and the setting cannot be recovered.

When NG is displayed as the result of the DEVICE TEST, the IC or its peripheral is defective. When NG is displayed on the PATH TEST, defect exists in between ICs.

6-2. Screen Transition in the Service Mode



Note: Do not execute 4) NAND Factory Setup in the 3)TEST MODE menu. (This item is dedicated for Factory use.) Otherwise, the memory data is deleted and the setting cannot be recovered.

6-3. Service Mode Menu Items and Description

1) When the key “1” is pressed down, the monitor display moves to the device check menu screen.
2) When the key “2” is pressed down, the monitor display moves to the path check menu screen between deivces.
3) When the key “3” is pressed down, the monitor display moves to the version check screen.
4) When the key “9” is pressed down, the monitor display moves to the hard disk check screen.
5) When the key “8” is pressed down, the monitor display moves to the TV guide check screen.

```
<< MAIN MENU >>
1) DEVICE TEST
2) PATH   TEST
3) TEST   MODE
8) TV GUIDE MODE
9) HDD  MODE
MODEL              ***
SYSCON Version   [ *** ]
```

6-4. Device Check Menu (1/2)

0) When the key “0” is pressed down, all devices are checked automatically.
1) When the key “1” is pressed down, the GPS3 device check will be executed.
2) When the key “2” is pressed down, the NAZCA device check will be executed.
3) When the key “3” is pressed down, the AUDY device check will be executed.
4) When the key “4” is pressed down, SILVIA device check will be executed.
5) When the key “5” is pressed down, the VIDEO DEC device check will be executed .
6) When the key “6” is pressed down, the AV ENC device check will be executed.
7) When the key “7” is pressed down, the MR device check will be executed.
8) When the key “8” is pressed down, the AV DEC device check will be executed.
9) When the key “9” is pressed down, the EEPROM device check will be executed.
10) When the key “→” is pressed down, the monitor display moves to the next device check screen.

```
<< DEVICE  TEST MENU 1/2 >>
0)  AUTO CHECK
1)  GPS3
2)  NAZCA
3)  AUDY
4)  SILVIA
5)  VIDEO DEC
6)  AV ENC
7)  MR
8)  AV DEC
9)  EEPROM


→ MENU 2
```

6-5. Device Check Menu (2/2)

1) When the key “1” is pressed down, the NAND FLASH device check will be executed.
2) Key “2” is not used.
   (In some cases, the message “NG” appears. But this equipment is normal and does not have any problem.)
3) Key “3” is not used.
   (In some cases, the message “NG” appears. But this equipment is normal and does not have any problem.)
4) Key “6” is not used.
   (In some cases, the message “NG” appears. But this equipment is normal and does not have any problem.)
5) When the key “7” is pressed down, the DV device check will be executed.
6) When the key “←” is pressed down, the monitor display returns to the previous device check menu screen.

```
<< DEVICE  TEST MENU 2/2 >>
1)  NAND FLASH
2)  DVD DRIVE  ← Not used
3)  HDD DRIVE  ← Not used


6)  SRC          ← Not used
7)  DV


← MENU 1
```

6-6. Path Check Menu (1/2)

1) When the key "0" is pressed down, the path check is automatically executed.
2) When the key "1" is pressed down, the NAZCA path check is executed.
3) When the key "2" is pressed down, the path check of PB between Sil to NZC will be executed.
4) When the key "3" is pressed down, the path check of EE between Sil to NZC will be executed.
5) When the key "4" is pressed down, the path check from Sil to AVENC(V) will be executed.
6) When the key "5" is pressed down, the path check of EE between VDEC to Sil will be executed. The video signal of input1 is output. (The screen is black when there is no input.) Confirm it is working normally, and press the ENTER key. The sign, "OK" appears.
7) When the key "6" is pressed down, the path check between AVENC to MR will be executed.
8) When the key "7" is pressed down, the path check between MR to AVEDEC will be executed.
9) When the key "8" is pressed down, the path check of Sil to ReEnc will be executed.
10) When the key "→" is pressed down, the monitor display moves to the next path check menu screen.

```
<< PATH   TEST MENU 1/2 >>
0)  AUTO CHECK
1)  NAZCA
2)  Sil – NZC PB
3)  Sil – NZC EE
4)  Sil – AVENC (V)
5)  VDEC – Sil EE
6)  AVENC – MR
7)  MR – AVDEC
8)  Sil ReEnc

→ MENU 2
```

6-7. Path Check Menu (2/2)

1) When the key "1" is pressed down, the path check among ADC to Sil to DAC will be executed.
2) When the key "←" is pressed down, the monitor display moves to the previous path check menu screen.

```
<< PATH   TEST MENU 2/2 >>
1)  ADC – Sil – DAC




←MENU 1
```

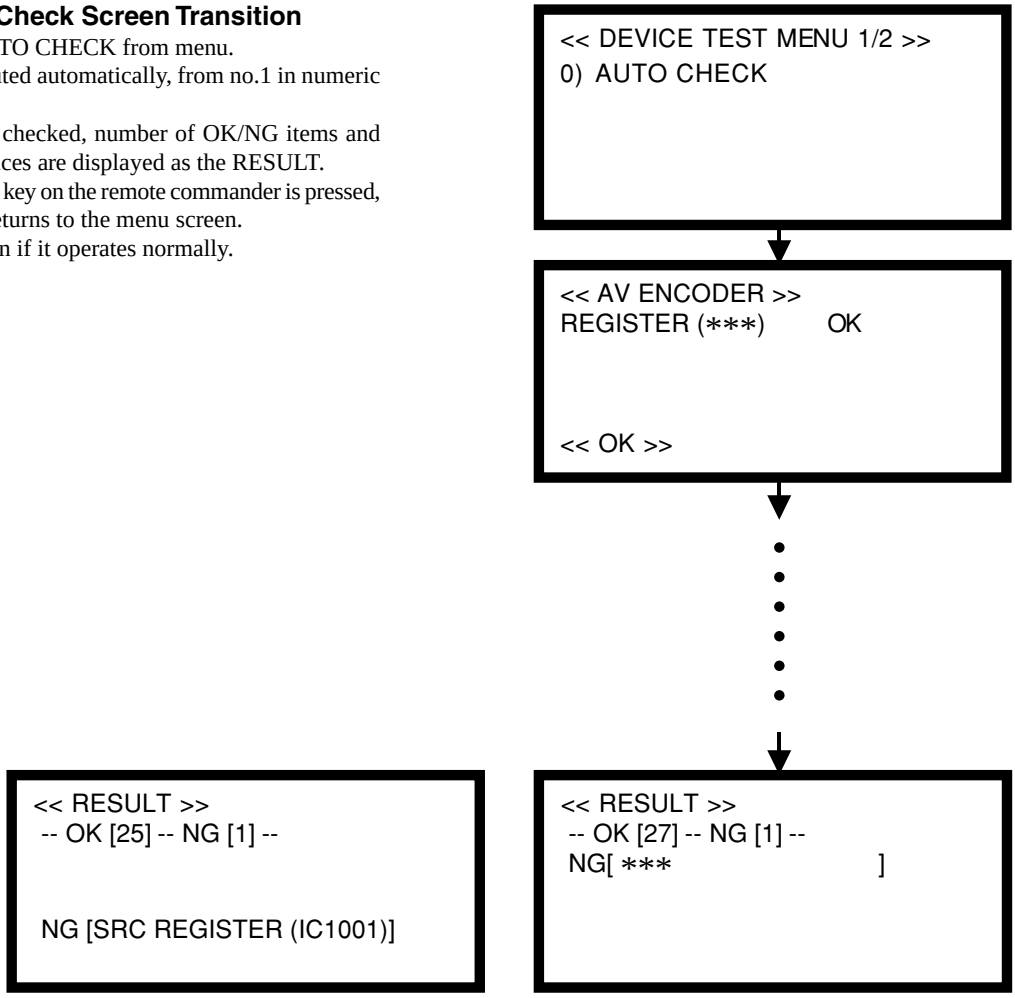
6-8. Hard Disk Check Menu

1) When the key "1" is pressed down, the ID check will be executed.
2) When the key "2" is pressed down, performance check will be executed.
3) When the key "3" is pressed down, WRITE ID will be executed.
4) When the key "4" is pressed down, Format will be executed.
5) When the key "9" is pressed down, Factory check will be executed.
6) When the "RETURN" key is pressed, the monitor display moves to the menu screen.

```
<< HDD MODE >>
1)  Indicate ID
2)  Performance Check
3)  Write ID
4)  Format
9)  Factory Check
```

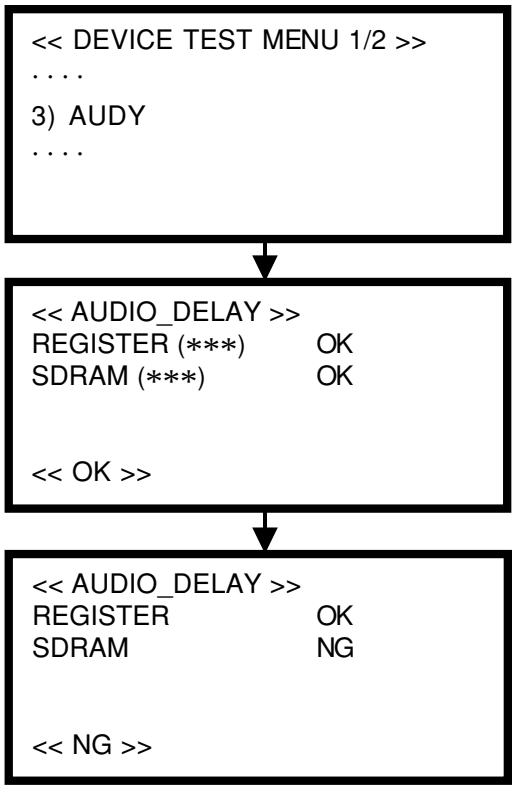
6-9. Device AUTO Check Screen Transition

1) Select the item of AUTO CHECK from menu.
2) Device check is executed automatically, from no.1 in numeric order.
3) When all devices are checked, number of OK/NG items and names of the NG devices are displayed as the RESULT.
4) When the "RETURN" key on the remote commander is pressed, the monitor display returns to the menu screen.
   * SRC shows NG even if it operates normally.



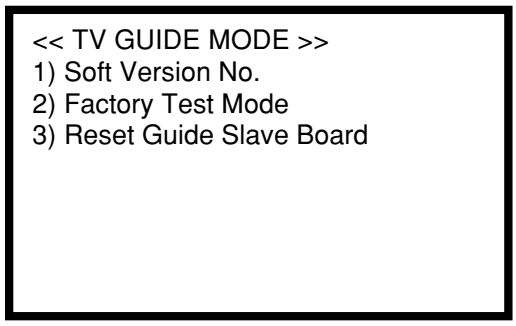
6-10. Device Individual Check, Screen Transition

1) Select the AUDY item from the menu.
2) Perform the register read/write that is the first of the check item and its result is displayed.
3) Perform the SDRAM check that is the second item of the check item and its result is displayed.
4) When check results of all items are OK, the message OK is displayed. If any one of the check items is found NG, the message NG is displayed.
5) When the "RETURN" key is pressed, the monitor display moves to the menu screen.



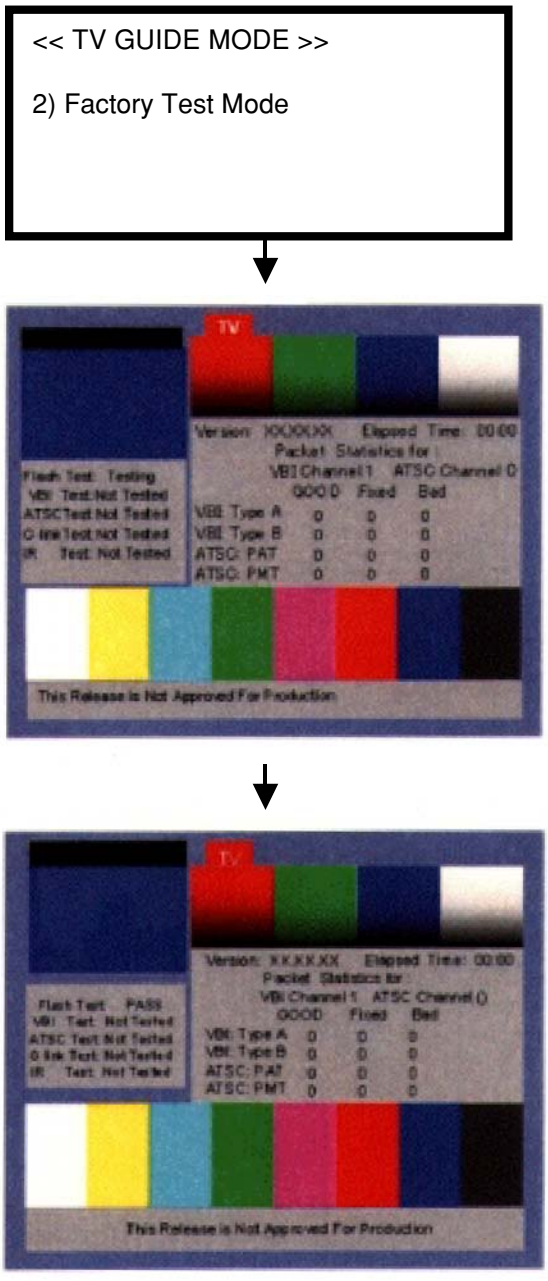
6-11. TV Guide Check Menu

1) When the key “1” is pressed down, soft version No. appear.
2) When the key “2” is pressed down, Factory Test will be executed.
3) When the key “3” is pressed down, TV Guide data will clear.



6-12. Factory Test Mode Screen Transition

1) Select the Factory Test Mode from the menu.
2) The Factry Test Mode screen appears and Flash Test starts.
3) When Read/Write of Flash is checked in the Factory Test Mode, the result is displayed in the Flash Test columns as either PASS or FAIL.
4) When the “RETURN” key on the remote commander is pressed, the monitor display return to the menu screen.



SECTION 7
ADJUSTMENT

7-1. EPG Video System Adjustment

Preparing for Adjustment

1. Equipments

• Oscilloscope
• Service Mode
8) TV GUIDE MODE
↓
2) Factory Test Mode

1. Videl Levl Adjustment (EPG-001 Board)

<Purpose>

This adjustment is made to satisfy the NTSC standard, If it is adjusted incorrectly, brightness will be too bright or too dark.

Mode	Video level adjustment in test mode
Signal	Color bars
Test point	LINE OUT (VIDEO) connector (terminated in 75 Ω)
Instrument	Oscilloscope
Adjusting element	RV001
Specification	1.0 Vp-p

Adjusting method:

1) Into Factory Test Mode of Service Mode, the trigger of scope is set to color bars.
2) Adjust RV001 for 1.0 Vp-p.

Fig. 7-1.

7-2. EPG S-Video Output S-Y Check

<Purpose>

This check confirms that the S-video output. If it adjusted incorrectly, color will be to dark or too thin.

Mode	Video level adjustment in test mode
Signal	Color bars
Test point	S VIDEO OUT (S-Y) connector (terminated in 75 Ω)
Instrument	Oscilloscope
Specification	1.0 ± 0.06Vp-p

Adjusting method:

1) Into Factory Test Mode of Service Mode, the trigger of scope is set to color bars.
2) Confirm that the S-Y level is 1.0 ± 0.06 Vp-p.

Fig. 7-2.

7-3. EPG S-Video Output S-C Level Check

<Purpose>

This check confirms that the S-video output S-C conforms to the NTSC standard. If it is adjusted incorrectly, color will be too dark or too thin.

Mode	Video level adjustment in test mode.
Signal	Color bars
Test point	S VIDEO OUT (S-C) connector (terminated in 75 Ω)
Instrument	Oscilloscope
Specification	286 ± 30mVp-p

Adjustment method :

1) Into Factory Test Mode of Service Mode, the trigger of scope is set to color bars.
2) Confirm that the burst signal level of S-C is 286 ± 30 mVp-p.

Fig. 7-3.

7-4. EPG Component Video Output Y Check

<Purpose>

This check confirms that the Y signal output is correct. If this signal level is not correct, brightness of the video signal will be too bright or too dark when the COMPONENT connector output signal is connected to the projector having COMPONENT input.

Mode	Video level adjustment in test mode
Signal	Color bars
Test point	COMPONENT VIDEO OUT (Y) connector (terminated in 75 Ω)
Instrument	Oscilloscope
Specification	1.0 ± 0.06Vp-p

Adjustment method:

1) Into Factory Test Mode of Service Mode, the trigger of scope is set to color bars.
2) Check that the Y level is 1.0 ± 0.06 Vp-p.

Fig. 7-4.

7-5. EPG Component Video Output B-Y Chec

<Purpose>

This check confirms that the B-Y signal of the component video output is correct. If this signal level is not correct, color of the video signal will have different color when the COMPONENT connector output signal is connected to the projector having COMPONENT input.

Mode	Video level adjustment in test mode
Signal	Color bars
Test point	COMPONENT VIDEO OUT (PB) terminal (terminated in 75 Ω)
Instrument	Oscilloscope
Specification	700 ± 50mVp-p

Adjustment method:

1) Into Factory Test Mode of Service Mode, the trigger of scope is set to color bars.
2) Confirm that the B-Y level is 700 ± 50 mVp-p.

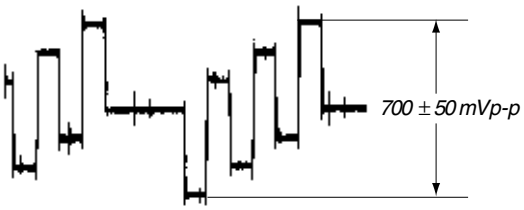


Fig. 7-5.

7-6. EPG Component Video Output R-Y Check

<Purpose>

This check confirms that the R-Y signal of the component video output is correct. If this signal level is not correct, color of the video signal will have different color when the COMPONENT connector output signal is connected to the projector having COMPONENT input.

Mode	Video level adjustment in test mode
Signal	Color bars
Test point	COMPONENT VIDEO OUT (PR) connector (terminated in 75 Ω)
Instrument	Oscilloscope
Specification	700 ± 50mVp-p

Adjustment method:

1) Into Factory Test Mode of Service Mode, the trigger of scope is set to color bars.
2) Confirm that the R-Y level is 700 ± 50 mVp-p.

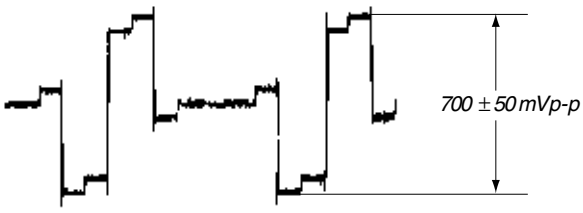


Fig. 7-6.

SECTION 8
REPAIR PARTS LIST

8-1. EXPLODED VIEWS

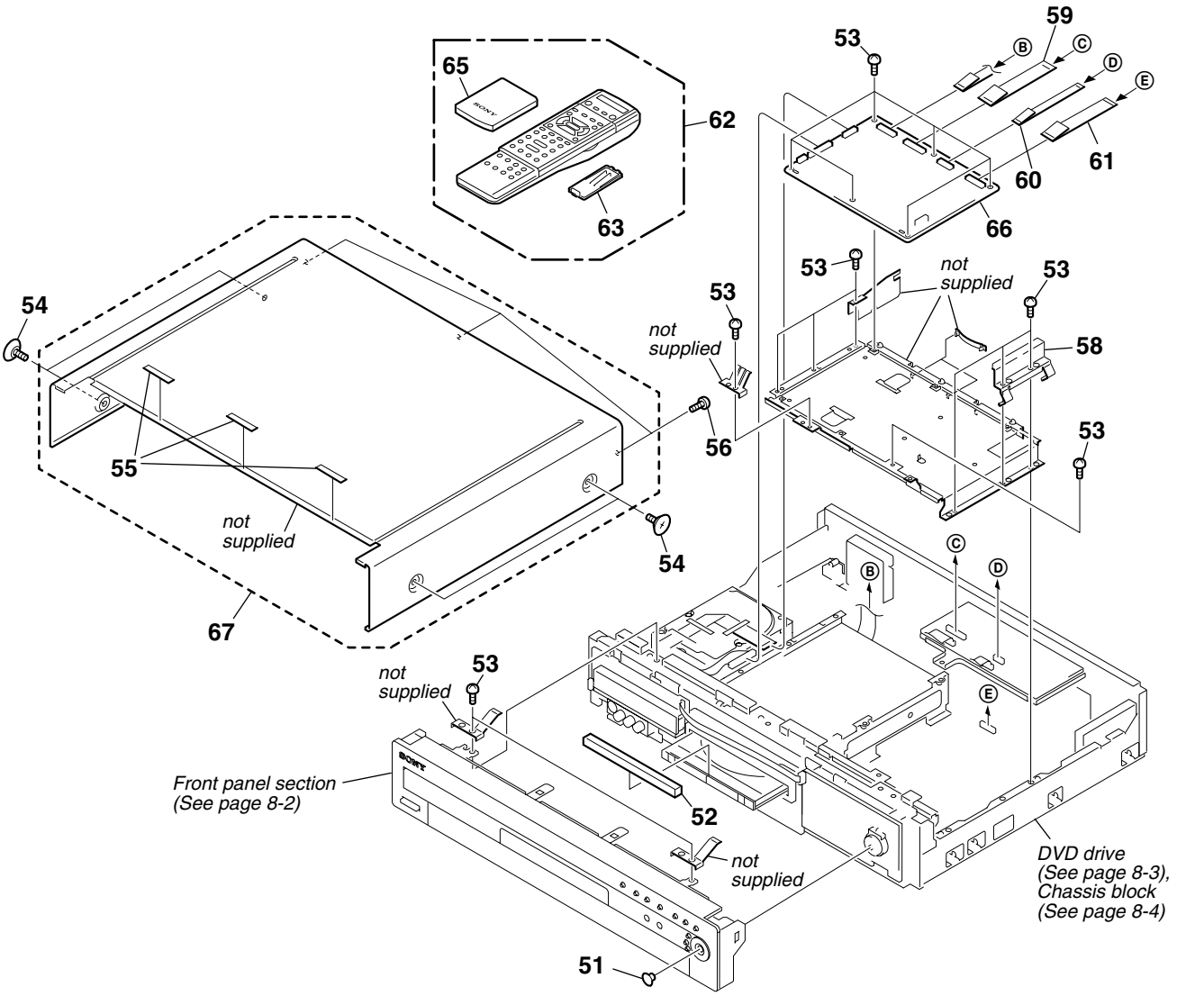
NOTE:

- -XX, -X mean standardized parts, so they may have some differences from the original one.
- Items marked "*" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- The mechanical parts with no reference number in the exploded views are not supplied.

The components identified by mark ⚠or dotted line with mark ⚠ are critical for safety. Replace only with part number specified.

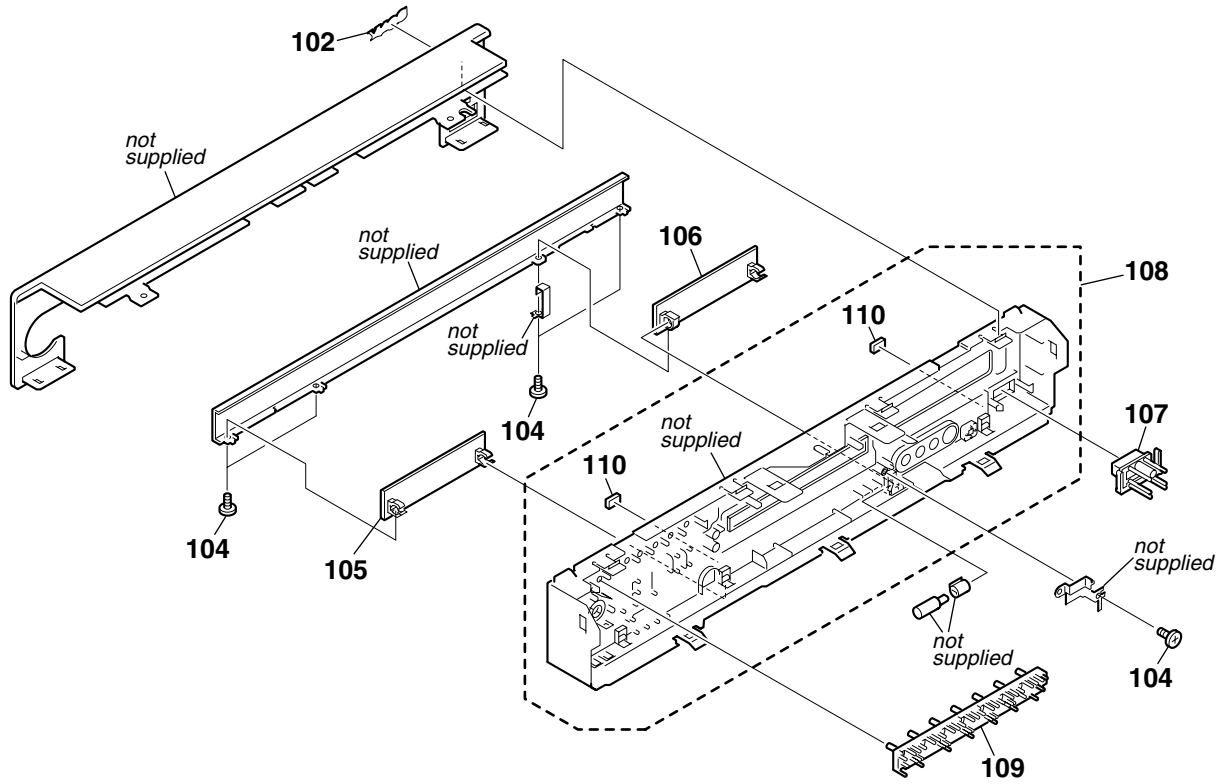
Les composants identifiés par une marque ⚠ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

8-1-1. OVERALL SECTION



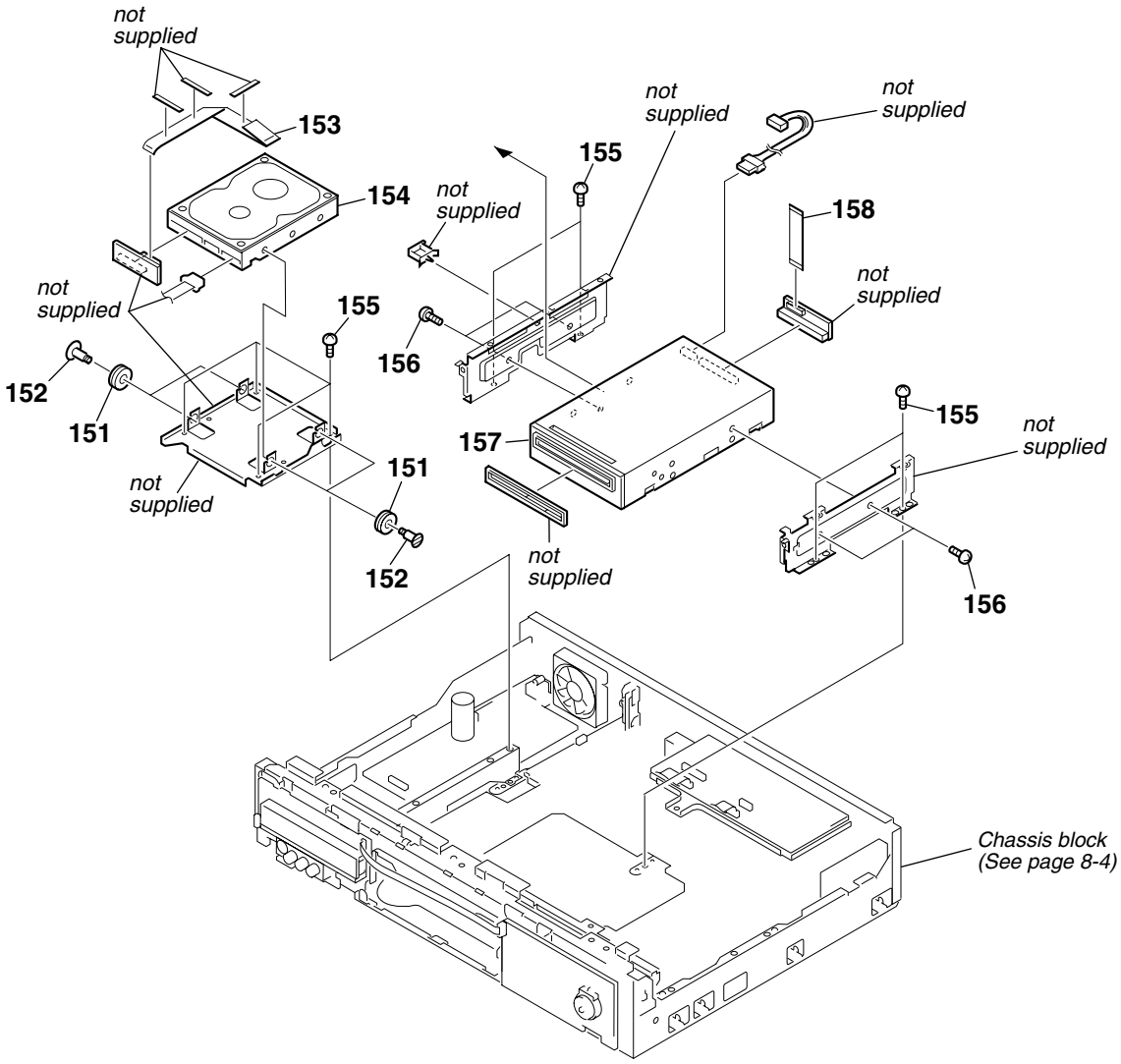
Ref. No.	Part No.	Description	Remarks
51	3-090-233-02	KNOB, CURSOR	
52	3-087-079-01	COVER, TRAY	
53	3-077-331-21	+BV3 (3-CR)	
54	3-070-883-21	SCREW, TAPPING	
55	3-089-200-01	CASE,SHEET	
56	3-077-331-31	+BV3 (3-CR)	
58	3-064-170-11	SPRING, GROUND PLATE	
59	1-829-787-11	CABLE, FLEXIBLE FLAT (FRE-1)	
60	1-829-788-11	CABLE, FLEXIBLE FLAT (FRE-2)	
61	1-829-221-11	CABLE, FLEXIBLE FLAT (FRA-7)	
62	1-478-987-11	REMOTE COMMANDER (RMT-D206A)	
63	3-071-119-91	LID,BATTERY CASE(FOR RMT-D206A)	
65	2-187-643-01	DOOR(RW2),SLID(FOR RMT-D206A)	
66	A-1077-048-A	RD-55 (UHS) COMPL	
67	A-1061-574-A	CASE, BLOCK ASSY, UPPER (SERVICE USE)	

8-1-2. FRONT PANEL SECTION



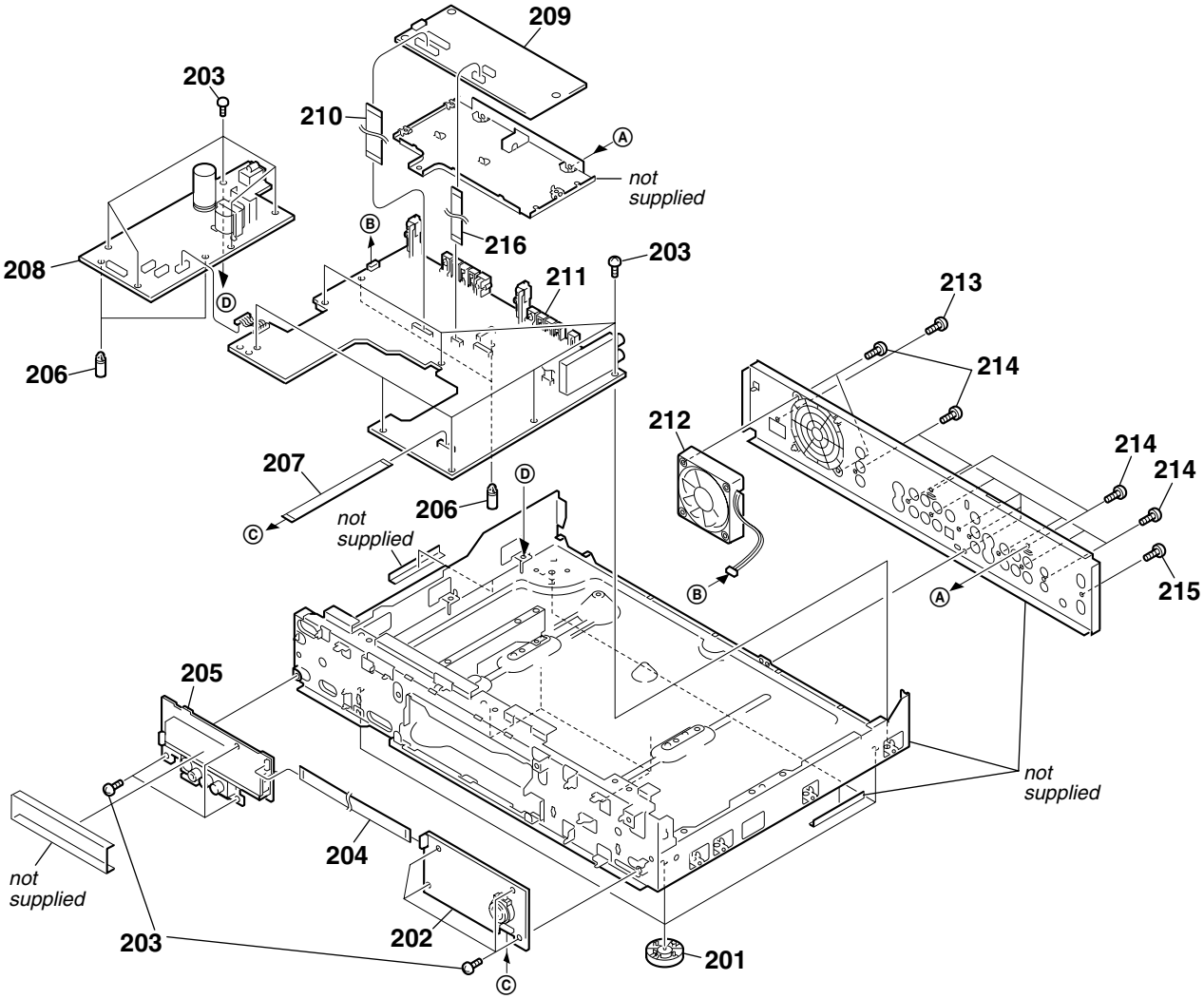
Ref. No.	Part No.	Description	Remarks
102	4-942-568-61	EMBLEM (NO.5), SONY	
104	4-921-277-51	SCREW (B2.6), TAPPING, BIND	
105	3-087-074-01	SHAFT (A), FUNCTION DOOR	
106	3-087-075-01	SHAFT (B), FUNCTION DOOR	
107	3-087-068-01	BUTTON, POWER	
108	X-2023-035-1	PANEL ASSY, FRONT	
109	X-3953-878-1	BUTTON ASSY, OPEN	
110	3-081-428-11	CUSHION, DOOR	

8-1-3. DVD DRIVE



Ref. No.	Part No.	Description	Remarks
151	3-074-849-01	DAMPER (SY)	
152	3-087-178-01	SCREW, HDD	
153	1-829-222-11	CABLE, FLEXIBLE FLAT (FRH-2)	
154	A-1084-212-A	HDD (WD-XL80-2-160GB) J ASSY (Used for Canadian model only.)	
155	3-077-331-21	+BV3 (3-CR)	
156	3-088-023-01	+B3 (3-CR)	
157	8-457-599-50	DRIVE, DVD DW-U15A-S2	
158	1-827-795-11	CABLE, FLEXIBLE FLAT (FRD-3)	

8-1-4. CHASSIS BLOCK



Ref. No.	Part No.	Description	Remarks
201	X-3953-877-1	FOOT ASSY	
202	A-1077-055-A	FR-215 (UH) COMPL	
203	3-077-331-21	+BV3 (3-CR)	
204	1-827-798-11	CABLE, FLEXIBLE FLAT (FLR-4)	
205	A-1077-053-A	FL-140 (UH) COMPL	
* 206	4-958-674-31	SPACER, MINIATURE CARD	
207	1-827-797-11	CABLE, FLEXIBLE FLAT (FAR-4)	
⚠208	1-468-842-11	POWER BLOCK	

Ref. No.	Part No.	Description	Remarks
209	A-1077-069-A	EPG-001 COMPL	
210	1-829-787-11	CABLE, FLEXIBLE FLAT (FRE-1)	
211	A-1077-051-A	AV-92 (UH) COMPL	
212	1-787-118-11	FAN, D.C.	
213	3-088-022-01	+P3 (B TYPE) (3-CR)	
214	3-077-331-31	+BV3 (3-CR)	
215	3-088-023-01	+B3 (3-CR)	
216	1-829-788-11	CABLE, FLEXIBLE FLAT (FRE-2)	

Note :
The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

Note :
Les composants identifiés par une marque ⚠ sont critiques pour la sécurité.
Ne les remplacer que par une pièce portant le numéro spécifié.

8-2. ELECTRICAL PARTS LIST

NOTE:

- Due to standardization, replacements in the parts list may be different from the parts specified in the diagrams or the components used on the set.
- -XX, -X mean standardized parts, so they may have some difference from the original one.
- Items marked "*" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- CAPACITORS:
  uF: μF
- RESISTORS
  All resistors are in ohms.
  METAL: metal-film resistor
  METAL OXIDE: Metal Oxide-film resistor
  F: nonflammable
- COILS
  uH: μH
- SEMICONDUCTORS
  In each case, u: μ, for example:
  uA...: μA... , uPA... , μPA... ,
  uPB... , μPB... , uPC... , μPC... ,
  uPD..., μPD...

When indicating parts by reference number, please include the board name.

The components identified by mark ⚠or dotted line with mark ⚠ are critical for safety. Replace only with part number specified.

Les composants identifiés par une marque ⚠ sont critiques pour la sécurité.
Ne les remplacer que par une pièce portant le numéro spécifié.

Ref. No.	Part No.	Description			Remarks
		CN-220 BOARD COMPL (NOT SUPPLIED)			
		**********			
		(REF.NO.;30,000 SERIES)			
		< CONNECTOR >			
CN1801	1-818-021-11	PIN, CONNECTOR 40P			
*	A-1077-048-A	RD-55 (UHS) BOARD COMPL			
		**********			
		(REF.NO.;20,000 SERIES)			
		< CAPACITOR >			
C103	1-124-779-00	ELECT CHIP	10uF	20%	16V
C109	1-124-779-00	ELECT CHIP	10uF	20%	16V
C115	1-124-779-00	ELECT CHIP	10uF	20%	16V
C116	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C117	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C118	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C119	1-124-779-00	ELECT CHIP	10uF	20%	16V
C120	1-124-779-00	ELECT CHIP	10uF	20%	16V
C123	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C125	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C126	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C127	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C128	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C132	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C133	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C135	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C136	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C137	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C138	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C139	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C140	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C141	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C142	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C144	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C145	1-162-913-11	CERAMIC CHIP	8PF	0.5PF	50V
C146	1-162-913-11	CERAMIC CHIP	8PF	0.5PF	50V
C147	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C148	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C149	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C150	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C151	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C153	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C154	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C155	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C201	1-164-874-11	CERAMIC CHIP	100PF	5%	50V
C202	1-124-779-00	ELECT CHIP	10uF	20%	16V
C204	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C205	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C206	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C207	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C208	1-164-943-11	CERAMIC CHIP	0.01uF	10%	16V
C324	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C327	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C328	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C329	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C330	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C331	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C332	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C333	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C334	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C335	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C336	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C337	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C338	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C339	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C340	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C341	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C342	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C343	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C344	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C345	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C346	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C347	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C348	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C349	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C350	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C351	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C352	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C353	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C354	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C355	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C356	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C357	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C358	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C359	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C360	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C361	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C362	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C363	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C364	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V

Ref. No.	Part No.	Description			Remarks
C373	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C401	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C402	1-164-943-11	CERAMIC CHIP	0.01uF	10%	16V
C501	1-124-779-00	ELECT CHIP	10uF	20%	16V
C502	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C503	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C504	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C505	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C506	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C507	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C701	1-124-779-00	ELECT CHIP	10uF	20%	16V
C702	1-124-779-00	ELECT CHIP	10uF	20%	16V
C704	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C705	1-124-779-00	ELECT CHIP	10uF	20%	16V
C706	1-124-779-00	ELECT CHIP	10uF	20%	16V
C707	1-124-779-00	ELECT CHIP	10uF	20%	16V
C708	1-124-779-00	ELECT CHIP	10uF	20%	16V
C715	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C716	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C717	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C718	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C719	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C720	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C721	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C722	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C723	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C724	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C725	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C726	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C727	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C728	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C729	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C730	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C731	1-162-915-11	CERAMIC CHIP	10PF	0.5PF	50V
C732	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C733	1-162-915-11	CERAMIC CHIP	10PF	0.5PF	50V
C734	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C735	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C736	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C737	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C738	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C739	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C740	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C741	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C803	1-124-779-00	ELECT CHIP	10uF	20%	16V
C808	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C809	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C812	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C813	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C814	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C815	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C816	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C817	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C818	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C819	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C820	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C821	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C822	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C823	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C901	1-124-779-00	ELECT CHIP	10uF	20%	16V
C903	1-124-779-00	ELECT CHIP	10uF	20%	16V
C905	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C906	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C907	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C908	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C910	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C911	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C912	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C913	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C914	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C915	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C916	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C917	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C918	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C919	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C920	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C921	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C922	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C923	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C924	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C925	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C926	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C928	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C1001	1-162-927-11	CERAMIC CHIP	100PF	5%	50V
C1002	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C1003	1-124-779-00	ELECT CHIP	10uF	20%	16V
C1004	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C1005	1-124-779-00	ELECT CHIP	10uF	20%	16V
C1006	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C1007	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C1101	1-124-779-00	ELECT CHIP	10uF	20%	16V
C1103	1-124-779-00	ELECT CHIP	10uF	20%	16V
C1105	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C1106	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C1107	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C1108	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C1109	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C1110	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C1112	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C1113	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C1114	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C1115	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C1116	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C1117	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C1118	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C1119	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C1120	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C1121	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C1122	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C1123	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C1124	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C1125	1-164-943-11	CERAMIC CHIP	0.01uF	10%	16V
C1126	1-164-943-11	CERAMIC CHIP	0.01uF	10%	16V
C1127	1-164-943-11	CERAMIC CHIP	0.01uF	10%	16V
C1130	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C1131	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C1132	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C1133	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C1201	1-124-779-00	ELECT CHIP	10uF	20%	16V
C1202	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V

Ref. No.	Part No.	Description			Remarks
C1203	1-124-779-00	ELECT CHIP	10uF	20%	16V
C1204	1-124-779-00	ELECT CHIP	10uF	20%	16V
C1206	1-164-943-11	CERAMIC CHIP	0.01uF	10%	16V
C1207	1-164-943-11	CERAMIC CHIP	0.01uF	10%	16V
C1209	1-164-943-11	CERAMIC CHIP	0.01uF	10%	16V
C1211	1-164-943-11	CERAMIC CHIP	0.01uF	10%	16V
C1212	1-164-943-11	CERAMIC CHIP	0.01uF	10%	16V
C1214	1-164-943-11	CERAMIC CHIP	0.01uF	10%	16V
C1215	1-164-943-11	CERAMIC CHIP	0.01uF	10%	16V
C1216	1-164-943-11	CERAMIC CHIP	0.01uF	10%	16V
C1217	1-164-943-11	CERAMIC CHIP	0.01uF	10%	16V
C1218	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C1219	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C1221	1-164-943-11	CERAMIC CHIP	0.01uF	10%	16V
C1222	1-164-943-11	CERAMIC CHIP	0.01uF	10%	16V
C1224	1-164-943-11	CERAMIC CHIP	0.01uF	10%	16V
C1225	1-164-943-11	CERAMIC CHIP	0.01uF	10%	16V
C1227	1-164-943-11	CERAMIC CHIP	0.01uF	10%	16V
C1228	1-164-943-11	CERAMIC CHIP	0.01uF	10%	16V
C1230	1-164-943-11	CERAMIC CHIP	0.01uF	10%	16V
C1231	1-164-943-11	CERAMIC CHIP	0.01uF	10%	16V
C1234	1-164-943-11	CERAMIC CHIP	0.01uF	10%	16V
C1235	1-164-943-11	CERAMIC CHIP	0.01uF	10%	16V
C1237	1-164-943-11	CERAMIC CHIP	0.01uF	10%	16V
C1238	1-164-943-11	CERAMIC CHIP	0.01uF	10%	16V
C1239	1-164-943-11	CERAMIC CHIP	0.01uF	10%	16V
C1240	1-164-943-11	CERAMIC CHIP	0.01uF	10%	16V
C1245	1-164-943-11	CERAMIC CHIP	0.01uF	10%	16V
C1249	1-124-779-00	ELECT CHIP	10uF	20%	16V
C1305	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C1308	1-126-206-11	ELECT CHIP	100uF	20%	6.3V
C1311	1-126-206-11	ELECT CHIP	100uF	20%	6.3V
C1313	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C1314	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C1317	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C1318	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C1319	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C1320	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C1321	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C1323	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C1324	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C1326	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C1327	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C1329	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C1330	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C1332	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C1333	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C1339	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C1340	1-162-927-11	CERAMIC CHIP	100PF	5%	50V
C1341	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C1342	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C1346	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C1347	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C1349	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C1350	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C1353	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C1354	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C1355	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C1356	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C1357	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C1358	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C1359	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C1360	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C1361	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C1362	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C1363	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C1364	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C1365	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C1366	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C1367	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C1368	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C1369	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C1371	1-124-779-00	ELECT CHIP	10uF	20%	16V
C1372	1-124-779-00	ELECT CHIP	10uF	20%	16V
C1374	1-124-779-00	ELECT CHIP	10uF	20%	16V
C1376	1-126-206-11	ELECT CHIP	100uF	20%	6.3V
C1377	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C1401	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C1501	1-164-943-11	CERAMIC CHIP	0.01uF	10%	16V
C1502	1-164-943-11	CERAMIC CHIP	0.01uF	10%	16V
C1503	1-164-943-11	CERAMIC CHIP	0.01uF	10%	16V
C1504	1-164-943-11	CERAMIC CHIP	0.01uF	10%	16V
C1505	1-164-943-11	CERAMIC CHIP	0.01uF	10%	16V
C1506	1-164-943-11	CERAMIC CHIP	0.01uF	10%	16V
C1508	1-164-943-11	CERAMIC CHIP	0.01uF	10%	16V
C1509	1-164-943-11	CERAMIC CHIP	0.01uF	10%	16V
C1510	1-124-779-00	ELECT CHIP	10uF	20%	16V
C1511	1-164-943-11	CERAMIC CHIP	0.01uF	10%	16V
C1512	1-164-943-11	CERAMIC CHIP	0.01uF	10%	16V
C1513	1-164-943-11	CERAMIC CHIP	0.01uF	10%	16V
C1514	1-164-943-11	CERAMIC CHIP	0.01uF	10%	16V
C1601	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C1602	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C1603	1-127-715-91	CERAMIC CHIP	0.22uF	10%	16V
C1604	1-124-779-00	ELECT CHIP	10uF	20%	16V
C1701	1-124-779-00	ELECT CHIP	10uF	20%	16V
C1702	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C1703	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C1704	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C1705	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C1707	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C1708	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C1709	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C1710	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C1711	1-162-916-11	CERAMIC CHIP	12PF	5%	50V
C1712	1-162-916-11	CERAMIC CHIP	12PF	5%	50V
C1805	1-126-390-11	ELECT CHIP	22uF	20%	6.3V
C1806	1-126-390-11	ELECT CHIP	22uF	20%	6.3V
C1807	1-126-394-11	ELECT CHIP	10uF	20%	16V
C1810	1-126-394-11	ELECT CHIP	10uF	20%	16V
C1811	1-126-206-11	ELECT CHIP	100uF	20%	6.3V
C1812	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C1813	1-126-394-11	ELECT CHIP	10uF	20%	16V
C1815	1-104-610-11	ELECT CHIP	47uF	20%	4V
C1816	1-104-610-11	ELECT CHIP	47uF	20%	4V
C1901	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C2104	1-124-779-00	ELECT CHIP	10uF	20%	16V
C2105	1-124-779-00	ELECT CHIP	10uF	20%	16V
C2114	1-164-943-11	CERAMIC CHIP	0.01uF	10%	16V
C2115	1-164-943-11	CERAMIC CHIP	0.01uF	10%	16V

Ref. No.	Part No.	Description			Remarks
C2116	1-164-943-11	CERAMIC CHIP	0.01uF	10%	16V
C2117	1-164-943-11	CERAMIC CHIP	0.01uF	10%	16V
C2118	1-164-943-11	CERAMIC CHIP	0.01uF	10%	16V
C2119	1-164-943-11	CERAMIC CHIP	0.01uF	10%	16V
C2120	1-164-943-11	CERAMIC CHIP	0.01uF	10%	16V
C2121	1-164-943-11	CERAMIC CHIP	0.01uF	10%	16V
C2122	1-164-943-11	CERAMIC CHIP	0.01uF	10%	16V
C2123	1-164-943-11	CERAMIC CHIP	0.01uF	10%	16V
C2124	1-164-943-11	CERAMIC CHIP	0.01uF	10%	16V
C2125	1-164-943-11	CERAMIC CHIP	0.01uF	10%	16V
C2126	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C2127	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C2128	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C2131	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C2132	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C2133	1-164-943-11	CERAMIC CHIP	0.01uF	10%	16V
C2134	1-164-943-11	CERAMIC CHIP	0.01uF	10%	16V
C2135	1-164-943-11	CERAMIC CHIP	0.01uF	10%	16V
C2136	1-164-943-11	CERAMIC CHIP	0.01uF	10%	16V
C2137	1-165-979-21	CERAMIC CHIP	0.01uF	10%	16V
C2138	1-164-943-11	CERAMIC CHIP	0.01uF	10%	16V
C2139	1-164-943-11	CERAMIC CHIP	0.01uF	10%	16V
C2140	1-164-943-11	CERAMIC CHIP	0.01uF	10%	16V
C2146	1-124-779-00	ELECT CHIP	10uF	20%	16V
C2202	1-124-779-00	ELECT CHIP	10uF	20%	16V
C2203	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C2204	1-164-943-11	CERAMIC CHIP	0.01uF	10%	16V
C2205	1-164-943-11	CERAMIC CHIP	0.01uF	10%	16V
C2206	1-164-943-11	CERAMIC CHIP	0.01uF	10%	16V
C2207	1-164-943-11	CERAMIC CHIP	0.01uF	10%	16V
C2208	1-162-913-11	CERAMIC CHIP	8PF	0.5PF	50V
C2209	1-162-913-11	CERAMIC CHIP	8PF	0.5PF	50V
C2210	1-164-943-11	CERAMIC CHIP	0.01uF	10%	16V
C2212	1-164-943-11	CERAMIC CHIP	0.01uF	10%	16V
C2213	1-164-943-11	CERAMIC CHIP	0.01uF	10%	16V
C2214	1-164-943-11	CERAMIC CHIP	0.01uF	10%	16V
C2215	1-164-943-11	CERAMIC CHIP	0.01uF	10%	16V
C2216	1-164-943-11	CERAMIC CHIP	0.01uF	10%	16V
C2217	1-125-837-91	CERAMIC CHIP	1uF	10%	6.3V
C2218	1-164-388-91	CERAMIC CHIP	270PF	5%	50V
C2219	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
		< CONNECTOR >			
CN103	1-764-177-11	PIN, CONNECTOR (SMD)(1.5MM) 7P			
CN1903	1-794-707-11	CONNECTOR, FFC/FPC 25P			
CN2201	1-770-161-21	PIN, CONNECTOR (PC BOARD) 6P			
		< DIODE >			
D101	8-719-066-17	DIODE FTZ6.8E-T148			
D202	8-719-988-61	DIODE 1SS355TE-17			
D1001	8-719-046-91	DIODE MA2S111			
D1001	8-719-056-23	DIODE MA2S111-(K8).SO			
D1002	8-719-046-91	DIODE MA2S111			
D1002	8-719-056-23	DIODE MA2S111-(K8).SO			
D1601	8-719-988-61	DIODE 1SS355TE-17			
D1801	8-719-075-77	DIODE EC10DA40-TE12			
D2103	8-719-027-95	DIODE HSM88WK			
D2104	8-719-081-96	DIODE KV1870STL-G			

Ref. No.	Part No.	Description	Remarks
		< FERRITE BEAD >	
FB901	1-469-324-21	FERRITE 0uH	
FB1801	1-469-324-21	FERRITE 0uH	
FB1802	1-469-324-21	FERRITE 0uH	
FB1803	1-469-324-21	FERRITE 0uH	
FB1804	1-469-324-21	FERRITE 0uH	
FB1805	1-469-324-21	FERRITE 0uH	
FB1901	1-469-083-21	FERRITE 0uH	
		< FILTER >	
FL101	1-234-867-11	FILTER, EMI REMOVAL (SMD)	
FL103	1-234-867-11	FILTER, EMI REMOVAL (SMD)	
FL201	1-234-867-11	FILTER, EMI REMOVAL (SMD)	
FL302	1-234-867-11	FILTER, EMI REMOVAL (SMD)	
FL501	1-234-867-11	FILTER, EMI REMOVAL (SMD)	
FL802	1-234-867-11	FILTER, EMI REMOVAL (SMD)	
FL901	1-234-867-11	FILTER, EMI REMOVAL (SMD)	
FL902	1-234-867-11	FILTER, EMI REMOVAL (SMD)	
FL1001	1-234-867-11	FILTER, EMI REMOVAL (SMD)	
FL1101	1-234-867-11	FILTER, EMI REMOVAL (SMD)	
FL1102	1-234-867-11	FILTER, EMI REMOVAL (SMD)	
FL1201	1-234-867-11	FILTER, EMI REMOVAL (SMD)	
FL1202	1-234-867-11	FILTER, EMI REMOVAL (SMD)	
FL1302	1-234-867-11	FILTER, EMI REMOVAL (SMD)	
FL1304	1-234-867-11	FILTER, EMI REMOVAL (SMD)	
FL1305	1-234-867-11	FILTER, EMI REMOVAL (SMD)	
FL1701	1-234-867-11	FILTER, EMI REMOVAL (SMD)	
FL1801	1-234-867-11	FILTER, EMI REMOVAL (SMD)	
FL1802	1-234-867-11	FILTER, EMI REMOVAL (SMD)	
FL1803	1-234-867-11	FILTER, EMI REMOVAL (SMD)	
FL1804	1-234-867-11	FILTER, EMI REMOVAL (SMD)	
FL1805	1-234-867-11	FILTER, EMI REMOVAL (SMD)	
FL2101	1-234-867-11	FILTER, EMI REMOVAL (SMD)	
FL2103	1-234-867-11	FILTER, EMI REMOVAL (SMD)	
FL2201	1-234-867-11	FILTER, EMI REMOVAL (SMD)	
FL2202	1-234-867-11	FILTER, EMI REMOVAL (SMD)	
		< IC >	
IC103	6-705-379-01	IC HD6417306BL200V	
IC104	8-759-573-97	IC SN74LVC541APWR	
IC106	6-703-875-01	IC CDCVF2505PWR	
IC108	6-705-296-01	IC MT48LC16M16A2P-75-Y16Y	
IC108	6-705-755-01	IC K4S561632E-UC75T	
IC108	6-706-007-01	IC HY57V561620CTP-HDR	
IC109	6-705-296-01	IC MT48LC16M16A2P-75-Y16Y	
IC109	6-705-755-01	IC K4S561632E-UC75T	
IC109	6-706-007-01	IC HY57V561620CTP-HDR	
IC111	6-707-301-01	IC BR24L32FJ-WE2	
IC112	6-703-583-01	IC SN74ACT08PWR	
IC201	6-705-297-01	IC MBM29Z0003PCN-KE1	
IC204	6-705-297-01	IC MBM29Z0003PCN-KE1	
IC301	6-701-025-01	IC SN74LVC16244ADGGR	
IC302	6-701-025-01	IC SN74LVC16244ADGGR	
IC303	8-759-392-81	IC SN74LVC16245ADGGR	
IC304	8-759-392-81	IC SN74LVC16245ADGGR	
IC305	6-701-025-01	IC SN74LVC16244ADGGR	
IC306	6-701-025-01	IC SN74LVC16244ADGGR	
IC307	8-759-392-81	IC SN74LVC16245ADGGR	

Ref. No.	Part No.	Description	Remarks
IC308	6-701-025-01	IC SN74LVC16244ADGGR	
IC309	6-701-025-01	IC SN74LVC16244ADGGR	
IC310	8-759-392-81	IC SN74LVC16245ADGGR	
IC401	8-759-680-48	IC TC7WH157FK(TE85R)	
IC402	6-705-336-01	IC K9F2808U0C-PCB0T	
IC501	6-705-324-01	IC CXD9778R	
IC701	6-705-312-01	IC S-T111B33MC-OGSTFG	
IC702	6-706-360-01	IC TVP5147PFP	
IC703	6-706-280-01	IC PQ1M185M2SPQ	
IC803	6-705-295-01	IC CXD9779R	
IC901	6-705-234-01	IC UPD61052GD-LML-A	
IC902	6-705-043-01	IC IC42S16400-7TG	
IC902	6-706-077-01	IC HY57V641620HGTP-P-DR	
IC903	6-705-043-01	IC IC42S16400-7TG	
IC903	6-706-077-01	IC HY57V641620HGTP-P-DR	
IC1001	6-703-644-01	IC AD1895AYRSZRL	
IC1101	6-705-298-01	IC CXD9777GG	
IC1102	6-705-296-01	IC MT48LC16M16A2P-75-Y16Y	
IC1102	6-705-755-01	IC K4S561632E-UC75T	
IC1102	6-706-007-01	IC HY57V561620CTP-HDR	
IC1201	6-705-311-01	IC S-T111B18MC-OGDTFG	
IC1202	8-752-416-45	IC CXD1935Q	
IC1203	6-705-043-01	IC IC42S16400-7TG	
IC1203	6-706-077-01	IC HY57V641620HGTP-P-DR	
IC1206	8-759-679-55	IC SN74LVC08APWR	
IC1301	8-752-424-75	IC CXD4701GB	
IC1304	6-704-838-01	IC MT48LC2M32B2P-7-Y94W	
IC1305	6-704-838-01	IC MT48LC2M32B2P-7-Y94W	
IC1306	6-705-312-01	IC S-T111B33MC-OGSTFG	
IC1402	8-759-549-01	IC SN74LV125APWR	
IC1501	6-705-008-11	IC CXD9722ATQ	
IC1502	6-703-845-01	IC IC42S16100-7TG (T&R)	
IC1502	6-705-992-01	IC HY57V161610ETP-7	
IC1502	6-705-992-11	IC HY57V161610ETP-7DR	
IC1601	6-703-704-01	IC AK4381VT-E2	
IC1701	8-759-679-55	IC SN74LVC08APWR	
IC1702	6-705-192-01	IC BU2367FV-FE2	
IC1703	8-759-679-55	IC SN74LVC08APWR	
IC1704	8-759-679-55	IC SN74LVC08APWR	
IC1802	6-705-292-01	IC PQ018EH02ZPH	
IC1803	6-704-923-01	IC PQ015EZ01ZPH	
IC1804	6-703-756-01	IC PQ1L503M2SPQ	
IC2102	6-706-366-01	IC UPD72893BGD-LML-A	
IC2103	6-703-845-01	IC IC42S16100-7TG (T&R)	
IC2103	6-705-992-01	IC HY57V161610ETP-7	
IC2103	6-705-992-11	IC HY57V161610ETP-7DR	
IC2105	8-759-096-87	IC TC7WU04FU(TE12R)	
IC2106	6-701-877-01	IC SM8707EV-G-E2	
IC2201	6-705-312-01	IC S-T111B33MC-OGSTFG	
IC2202	6-706-365-01	IC UPD72852AGB-8EU-A	

< COIL >

L701	1-469-967-21	INDUCTOR	10uH	
L702	1-469-967-21	INDUCTOR	10uH	
L1301	1-400-145-21	INDUCTOR	47uH	
L2102	1-410-371-41	INDUCTOR	1.5uH	
LF2201	1-419-370-21	INDUCTOR	0uH	
LF2202	1-419-370-21	INDUCTOR	0uH	

Ref. No.	Part No.	Description			Remarks
		< TRANSISTOR >			
Q1301	8-729-010-05	TRANSISTOR MSB709-RT1			
Q1302	8-729-010-05	TRANSISTOR MSB709-RT1			
Q1303	8-729-010-05	TRANSISTOR MSB709-RT1			
Q1304	8-729-010-05	TRANSISTOR MSB709-RT1			
Q1305	8-729-010-05	TRANSISTOR MSB709-RT1			
Q1306	8-729-010-05	TRANSISTOR MSB709-RT1			
Q2101	1-801-806-11	TRANSISTOR DTC144EKA			
		< RESISTOR >			
R102	1-218-941-81	RES-CHIP	100	5%	1/16W
R103	1-218-965-11	RES-CHIP	10K	5%	1/16W
R104	1-218-941-81	RES-CHIP	100	5%	1/16W
R105	1-218-941-81	RES-CHIP	100	5%	1/16W
R106	1-218-990-11	SHORT CHIP	0		
R113	1-218-990-11	SHORT CHIP	0		
R115	1-218-990-11	SHORT CHIP	0		
R118	1-218-990-11	SHORT CHIP	0		
R120	1-218-990-11	SHORT CHIP	0		
R121	1-218-990-11	SHORT CHIP	0		
R122	1-218-990-11	SHORT CHIP	0		
R123	1-218-990-11	SHORT CHIP	0		
R134	1-218-961-11	RES-CHIP	4.7K	5%	1/16W
R135	1-218-961-11	RES-CHIP	4.7K	5%	1/16W
R136	1-218-990-11	SHORT CHIP	0		
R137	1-216-864-11	SHORT CHIP	0		
R140	1-218-965-11	RES-CHIP	10K	5%	1/16W
R141	1-218-990-11	SHORT CHIP	0		
R143	1-216-864-11	SHORT CHIP	0		
R144	1-218-961-11	RES-CHIP	4.7K	5%	1/16W
R145	1-218-961-11	RES-CHIP	4.7K	5%	1/16W
R146	1-218-961-11	RES-CHIP	4.7K	5%	1/16W
R149	1-218-938-11	RES-CHIP	56	5%	1/16W
R150	1-218-929-11	RES-CHIP	10	5%	1/16W
R152	1-218-929-11	RES-CHIP	10	5%	1/16W
R154	1-218-938-11	RES-CHIP	56	5%	1/16W
R155	1-218-938-11	RES-CHIP	56	5%	1/16W
R161	1-218-957-11	RES-CHIP	2.2K	5%	1/16W
R162	1-218-937-11	RES-CHIP	47	5%	1/16W
R163	1-218-965-11	RES-CHIP	10K	5%	1/16W
R164	1-218-965-11	RES-CHIP	10K	5%	1/16W
R165	1-218-965-11	RES-CHIP	10K	5%	1/16W
R166	1-218-965-11	RES-CHIP	10K	5%	1/16W
R167	1-218-929-11	RES-CHIP	10	5%	1/16W
R168	1-218-965-11	RES-CHIP	10K	5%	1/16W
R170	1-218-990-11	SHORT CHIP	0		
R171	1-218-965-11	RES-CHIP	10K	5%	1/16W
R172	1-218-965-11	RES-CHIP	10K	5%	1/16W
R174	1-218-957-11	RES-CHIP	2.2K	5%	1/16W
R175	1-218-990-11	SHORT CHIP	0		
R176	1-218-938-11	RES-CHIP	56	5%	1/16W
R179	1-218-965-11	RES-CHIP	10K	5%	1/16W
R181	1-218-957-11	RES-CHIP	2.2K	5%	1/16W
R182	1-218-965-11	RES-CHIP	10K	5%	1/16W
R183	1-218-965-11	RES-CHIP	10K	5%	1/16W
R184	1-218-965-11	RES-CHIP	10K	5%	1/16W
R185	1-218-965-11	RES-CHIP	10K	5%	1/16W
R186	1-218-965-11	RES-CHIP	10K	5%	1/16W
R187	1-218-990-11	SHORT CHIP	0		
R189	1-218-990-11	SHORT CHIP	0		

Ref. No.	Part No.	Description			Remarks
R190	1-218-938-11	RES-CHIP	56	5%	1/16W
R193	1-218-957-11	RES-CHIP	2.2K	5%	1/16W
R194	1-218-937-11	RES-CHIP	47	5%	1/16W
R195	1-218-938-11	RES-CHIP	56	5%	1/16W
R206	1-218-965-11	RES-CHIP	10K	5%	1/16W
R214	1-218-965-11	RES-CHIP	10K	5%	1/16W
R215	1-218-965-11	RES-CHIP	10K	5%	1/16W
R224	1-218-990-11	SHORT CHIP	0		
R303	1-218-937-11	RES-CHIP	47	5%	1/16W
R308	1-218-938-11	RES-CHIP	56	5%	1/16W
R309	1-218-965-11	RES-CHIP	10K	5%	1/16W
R310	1-218-965-11	RES-CHIP	10K	5%	1/16W
R311	1-218-965-11	RES-CHIP	10K	5%	1/16W
R314	1-218-933-11	RES-CHIP	22	5%	1/16W
R315	1-218-938-11	RES-CHIP	56	5%	1/16W
R316	1-218-937-11	RES-CHIP	47	5%	1/16W
R317	1-218-938-11	RES-CHIP	56	5%	1/16W
R319	1-218-965-11	RES-CHIP	10K	5%	1/16W
R322	1-218-965-11	RES-CHIP	10K	5%	1/16W
R323	1-218-939-11	RES-CHIP	68	5%	1/16W
R324	1-218-939-11	RES-CHIP	68	5%	1/16W
R325	1-218-939-11	RES-CHIP	68	5%	1/16W
R326	1-218-939-11	RES-CHIP	68	5%	1/16W
R328	1-218-938-11	RES-CHIP	56	5%	1/16W
R329	1-218-938-11	RES-CHIP	56	5%	1/16W
R330	1-218-938-11	RES-CHIP	56	5%	1/16W
R335	1-218-965-11	RES-CHIP	10K	5%	1/16W
R345	1-218-990-11	SHORT CHIP	0		
R346	1-218-934-11	RES-CHIP	27	5%	1/16W
R347	1-218-935-11	RES-CHIP	33	5%	1/16W
R348	1-218-935-11	RES-CHIP	33	5%	1/16W
R349	1-218-936-11	RES-CHIP	39	5%	1/16W
R350	1-218-935-11	RES-CHIP	33	5%	1/16W
R351	1-218-935-11	RES-CHIP	33	5%	1/16W
R352	1-218-933-11	RES-CHIP	22	5%	1/16W
R353	1-218-937-11	RES-CHIP	47	5%	1/16W
R354	1-218-939-11	RES-CHIP	68	5%	1/16W
R355	1-218-939-11	RES-CHIP	68	5%	1/16W
R356	1-218-937-11	RES-CHIP	47	5%	1/16W
R358	1-218-937-11	RES-CHIP	47	5%	1/16W
R360	1-218-937-11	RES-CHIP	47	5%	1/16W
R361	1-218-937-11	RES-CHIP	47	5%	1/16W
R363	1-218-965-11	RES-CHIP	10K	5%	1/16W
R364	1-218-965-11	RES-CHIP	10K	5%	1/16W
R376	1-218-937-11	RES-CHIP	47	5%	1/16W
R377	1-218-938-11	RES-CHIP	56	5%	1/16W
R391	1-218-990-11	SHORT CHIP	0		
R393	1-218-990-11	SHORT CHIP	0		
R408	1-218-990-11	SHORT CHIP	0		
R409	1-218-965-11	RES-CHIP	10K	5%	1/16W
R411	1-218-953-11	RES-CHIP	1K	5%	1/16W
R424	1-218-965-11	RES-CHIP	10K	5%	1/16W
R425	1-218-965-11	RES-CHIP	10K	5%	1/16W
R502	1-218-965-11	RES-CHIP	10K	5%	1/16W
R503	1-218-965-11	RES-CHIP	10K	5%	1/16W
R504	1-218-965-11	RES-CHIP	10K	5%	1/16W
R510	1-218-965-11	RES-CHIP	10K	5%	1/16W
R511	1-218-965-11	RES-CHIP	10K	5%	1/16W
R512	1-218-965-11	RES-CHIP	10K	5%	1/16W
R513	1-218-965-11	RES-CHIP	10K	5%	1/16W

Ref. No.	Part No.	Description			Remarks
R515	1-218-965-11	RES-CHIP	10K	5%	1/16W
R524	1-218-933-11	RES-CHIP	22	5%	1/16W
R525	1-218-933-11	RES-CHIP	22	5%	1/16W
R526	1-218-933-11	RES-CHIP	22	5%	1/16W
R528	1-218-990-11	SHORT CHIP	0		
R530	1-218-990-11	SHORT CHIP	0		
R536	1-218-990-11	SHORT CHIP	0		
R541	1-218-965-11	RES-CHIP	10K	5%	1/16W
R544	1-218-965-11	RES-CHIP	10K	5%	1/16W
R547	1-218-965-11	RES-CHIP	10K	5%	1/16W
R549	1-218-965-11	RES-CHIP	10K	5%	1/16W
R550	1-218-965-11	RES-CHIP	10K	5%	1/16W
R552	1-218-965-11	RES-CHIP	10K	5%	1/16W
R554	1-218-965-11	RES-CHIP	10K	5%	1/16W
R556	1-218-965-11	RES-CHIP	10K	5%	1/16W
R558	1-218-965-11	RES-CHIP	10K	5%	1/16W
R561	1-218-965-11	RES-CHIP	10K	5%	1/16W
R568	1-218-965-11	RES-CHIP	10K	5%	1/16W
R572	1-218-965-11	RES-CHIP	10K	5%	1/16W
R573	1-218-965-11	RES-CHIP	10K	5%	1/16W
R576	1-218-965-11	RES-CHIP	10K	5%	1/16W
R577	1-218-965-11	RES-CHIP	10K	5%	1/16W
R579	1-218-990-11	SHORT CHIP	0		
R580	1-218-965-11	RES-CHIP	10K	5%	1/16W
R581	1-218-965-11	RES-CHIP	10K	5%	1/16W
R582	1-218-935-11	RES-CHIP	33	5%	1/16W
R583	1-218-965-11	RES-CHIP	10K	5%	1/16W
R585	1-218-965-11	RES-CHIP	10K	5%	1/16W
R587	1-218-965-11	RES-CHIP	10K	5%	1/16W
R598	1-218-965-11	RES-CHIP	10K	5%	1/16W
R599	1-218-990-11	SHORT CHIP	0		
R702	1-218-990-11	SHORT CHIP	0		
R704	1-218-990-11	SHORT CHIP	0		
R706	1-218-990-11	SHORT CHIP	0		
R708	1-218-990-11	SHORT CHIP	0		
R710	1-218-990-11	SHORT CHIP	0		
R711	1-218-990-11	SHORT CHIP	0		
R714	1-218-990-11	SHORT CHIP	0		
R715	1-218-977-11	RES-CHIP	100K	5%	1/16W
R716	1-218-933-11	RES-CHIP	22	5%	1/16W
R717	1-218-941-81	RES-CHIP	100	5%	1/16W
R718	1-218-933-11	RES-CHIP	22	5%	1/16W
R719	1-218-941-81	RES-CHIP	100	5%	1/16W
R720	1-218-965-11	RES-CHIP	10K	5%	1/16W
R722	1-218-990-11	SHORT CHIP	0		
R726	1-218-990-11	SHORT CHIP	0		
R727	1-218-965-11	RES-CHIP	10K	5%	1/16W
R729	1-218-965-11	RES-CHIP	10K	5%	1/16W
R736	1-218-957-11	RES-CHIP	2.2K	5%	1/16W
R739	1-218-957-11	RES-CHIP	2.2K	5%	1/16W
R740	1-218-965-11	RES-CHIP	10K	5%	1/16W
R826	1-218-935-11	RES-CHIP	33	5%	1/16W
R827	1-218-935-11	RES-CHIP	33	5%	1/16W
R828	1-218-935-11	RES-CHIP	33	5%	1/16W
R829	1-218-935-11	RES-CHIP	33	5%	1/16W
R830	1-218-935-11	RES-CHIP	33	5%	1/16W
R831	1-218-935-11	RES-CHIP	33	5%	1/16W
R832	1-218-935-11	RES-CHIP	33	5%	1/16W
R849	1-218-965-11	RES-CHIP	10K	5%	1/16W
R852	1-218-965-11	RES-CHIP	10K	5%	1/16W

Ref. No.	Part No.	Description			Remarks
R868	1-218-935-11	RES-CHIP	33	5%	1/16W
R871	1-218-935-11	RES-CHIP	33	5%	1/16W
R873	1-218-935-11	RES-CHIP	33	5%	1/16W
R875	1-218-935-11	RES-CHIP	33	5%	1/16W
R879	1-218-935-11	RES-CHIP	33	5%	1/16W
R882	1-218-935-11	RES-CHIP	33	5%	1/16W
R884	1-218-935-11	RES-CHIP	33	5%	1/16W
R886	1-218-935-11	RES-CHIP	33	5%	1/16W
R888	1-218-935-11	RES-CHIP	33	5%	1/16W
R892	1-218-935-11	RES-CHIP	33	5%	1/16W
R894	1-218-935-11	RES-CHIP	33	5%	1/16W
R897	1-218-935-11	RES-CHIP	33	5%	1/16W
R899	1-218-935-11	RES-CHIP	33	5%	1/16W
R903	1-218-973-11	RES-CHIP	47K	5%	1/16W
R904	1-216-864-11	SHORT CHIP	0		
R906	1-218-941-81	RES-CHIP	100	5%	1/16W
R907	1-218-990-11	SHORT CHIP	0		
R909	1-218-937-11	RES-CHIP	47	5%	1/16W
R910	1-218-965-11	RES-CHIP	10K	5%	1/16W
R911	1-218-937-11	RES-CHIP	47	5%	1/16W
R917	1-218-990-11	SHORT CHIP	0		
R918	1-218-965-11	RES-CHIP	10K	5%	1/16W
R919	1-218-965-11	RES-CHIP	10K	5%	1/16W
R920	1-218-965-11	RES-CHIP	10K	5%	1/16W
R921	1-218-965-11	RES-CHIP	10K	5%	1/16W
R924	1-218-965-11	RES-CHIP	10K	5%	1/16W
R925	1-218-937-11	RES-CHIP	47	5%	1/16W
R926	1-218-937-11	RES-CHIP	47	5%	1/16W
R927	1-218-937-11	RES-CHIP	47	5%	1/16W
R928	1-218-937-11	RES-CHIP	47	5%	1/16W
R929	1-218-937-11	RES-CHIP	47	5%	1/16W
R930	1-218-937-11	RES-CHIP	47	5%	1/16W
R931	1-218-939-11	RES-CHIP	68	5%	1/16W
R935	1-218-937-11	RES-CHIP	47	5%	1/16W
R1005	1-218-973-11	RES-CHIP	47K	5%	1/16W
R1023	1-218-941-81	RES-CHIP	100	5%	1/16W
R1105	1-218-990-11	SHORT CHIP	0		
R1106	1-218-965-11	RES-CHIP	10K	5%	1/16W
R1108	1-218-935-11	RES-CHIP	33	5%	1/16W
R1112	1-218-935-11	RES-CHIP	33	5%	1/16W
R1113	1-218-935-11	RES-CHIP	33	5%	1/16W
R1118	1-218-935-11	RES-CHIP	33	5%	1/16W
R1121	1-218-935-11	RES-CHIP	33	5%	1/16W
R1123	1-218-935-11	RES-CHIP	33	5%	1/16W
R1124	1-218-935-11	RES-CHIP	33	5%	1/16W
R1126	1-218-935-11	RES-CHIP	33	5%	1/16W
R1142	1-218-935-11	RES-CHIP	33	5%	1/16W
R1144	1-218-965-11	RES-CHIP	10K	5%	1/16W
R1145	1-218-935-11	RES-CHIP	33	5%	1/16W
R1149	1-218-965-11	RES-CHIP	10K	5%	1/16W
R1151	1-218-935-11	RES-CHIP	33	5%	1/16W
R1153	1-218-965-11	RES-CHIP	10K	5%	1/16W
R1166	1-218-965-11	RES-CHIP	10K	5%	1/16W
R1167	1-218-962-11	RES-CHIP	5.6K	5%	1/16W
R1168	1-218-965-11	RES-CHIP	10K	5%	1/16W
R1169	1-218-962-11	RES-CHIP	5.6K	5%	1/16W
R1170	1-218-935-11	RES-CHIP	33	5%	1/16W
R1171	1-218-940-11	RES-CHIP	82	5%	1/16W
R1172	1-218-933-11	RES-CHIP	22	5%	1/16W
R1173	1-218-940-11	RES-CHIP	82	5%	1/16W
R1174	1-218-933-11	RES-CHIP	22	5%	1/16W
R1175	1-218-933-11	RES-CHIP	22	5%	1/16W
R1176	1-218-940-11	RES-CHIP	82	5%	1/16W
R1177	1-218-935-11	RES-CHIP	33	5%	1/16W
R1178	1-218-935-11	RES-CHIP	33	5%	1/16W
R1179	1-218-940-11	RES-CHIP	82	5%	1/16W
R1180	1-218-933-11	RES-CHIP	22	5%	1/16W
R1181	1-218-940-11	RES-CHIP	82	5%	1/16W
R1182	1-218-933-11	RES-CHIP	22	5%	1/16W
R1183	1-218-933-11	RES-CHIP	22	5%	1/16W
R1184	1-218-940-11	RES-CHIP	82	5%	1/16W
R1185	1-218-935-11	RES-CHIP	33	5%	1/16W
R1198	1-218-953-11	RES-CHIP	1K	5%	1/16W
R1201	1-216-864-11	SHORT CHIP	0		
R1204	1-218-941-81	RES-CHIP	100	5%	1/16W
R1205	1-218-933-11	RES-CHIP	22	5%	1/16W
R1210	1-218-937-11	RES-CHIP	47	5%	1/16W
R1211	1-218-965-11	RES-CHIP	10K	5%	1/16W
R1212	1-218-965-11	RES-CHIP	10K	5%	1/16W
R1213	1-218-959-11	RES-CHIP	3.3K	5%	1/16W
R1214	1-218-957-11	RES-CHIP	2.2K	5%	1/16W
R1219	1-218-990-11	SHORT CHIP	0		
R1223	1-218-965-11	RES-CHIP	10K	5%	1/16W
R1226	1-218-957-11	RES-CHIP	2.2K	5%	1/16W
R1229	1-218-953-11	RES-CHIP	1K	5%	1/16W
R1230	1-218-929-11	RES-CHIP	10	5%	1/16W
R1236	1-218-965-11	RES-CHIP	10K	5%	1/16W
R1254	1-218-990-11	SHORT CHIP	0		
R1271	1-218-961-11	RES-CHIP	4.7K	5%	1/16W
R1274	1-218-961-11	RES-CHIP	4.7K	5%	1/16W
R1275	1-218-939-11	RES-CHIP	68	5%	1/16W
R1276	1-218-961-11	RES-CHIP	4.7K	5%	1/16W
R1277	1-218-961-11	RES-CHIP	4.7K	5%	1/16W
R1279	1-218-938-11	RES-CHIP	56	5%	1/16W
R1281	1-218-937-11	RES-CHIP	47	5%	1/16W
R1289	1-218-937-11	RES-CHIP	47	5%	1/16W
R1290	1-218-937-11	RES-CHIP	47	5%	1/16W
R1291	1-218-937-11	RES-CHIP	47	5%	1/16W
R1292	1-218-937-11	RES-CHIP	47	5%	1/16W
R1301	1-218-957-11	RES-CHIP	2.2K	5%	1/16W
R1302	1-218-957-11	RES-CHIP	2.2K	5%	1/16W
R1303	1-218-957-11	RES-CHIP	2.2K	5%	1/16W
R1304	1-218-957-11	RES-CHIP	2.2K	5%	1/16W
R1305	1-218-957-11	RES-CHIP	2.2K	5%	1/16W
R1306	1-218-957-11	RES-CHIP	2.2K	5%	1/16W
R1308	1-218-933-11	RES-CHIP	22	5%	1/16W
R1310	1-218-933-11	RES-CHIP	22	5%	1/16W
R1312	1-218-933-11	RES-CHIP	22	5%	1/16W
R1314	1-218-933-11	RES-CHIP	22	5%	1/16W
R1316	1-218-933-11	RES-CHIP	22	5%	1/16W
R1318	1-218-933-11	RES-CHIP	22	5%	1/16W
R1319	1-208-860-81	METAL CHIP	75	0.5%	1/16W
R1320	1-208-860-81	METAL CHIP	75	0.5%	1/16W
R1321	1-208-860-81	METAL CHIP	75	0.5%	1/16W
R1322	1-208-860-81	METAL CHIP	75	0.5%	1/16W
R1324	1-218-990-11	SHORT CHIP	0		
R1329	1-218-990-11	SHORT CHIP	0		
R1330	1-208-860-81	METAL CHIP	75	0.5%	1/16W
R1331	1-208-860-81	METAL CHIP	75	0.5%	1/16W
R1332	1-218-965-11	RES-CHIP	10K	5%	1/16W

Ref. No.	Part No.	Description			Remarks
R1338	1-218-990-11	SHORT CHIP	0		
R1339	1-218-990-11	SHORT CHIP	0		
R1340	1-218-965-11	RES-CHIP	10K	5%	1/16W
R1341	1-218-958-11	METAL CHIP	2.7K	5%	1/16W
R1342	1-218-958-11	METAL CHIP	2.7K	5%	1/16W
R1343	1-218-958-11	METAL CHIP	2.7K	5%	1/16W
R1344	1-218-990-11	SHORT CHIP	0		
R1345	1-218-990-11	SHORT CHIP	0		
R1346	1-218-958-11	METAL CHIP	2.7K	5%	1/16W
R1347	1-218-958-11	METAL CHIP	2.7K	5%	1/16W
R1348	1-218-965-11	RES-CHIP	10K	5%	1/16W
R1349	1-218-965-11	RES-CHIP	10K	5%	1/16W
R1351	1-218-958-11	METAL CHIP	2.7K	5%	1/16W
R1353	1-218-965-11	RES-CHIP	10K	5%	1/16W
R1356	1-218-938-11	RES-CHIP	56	5%	1/16W
R1359	1-218-938-11	RES-CHIP	56	5%	1/16W
R1362	1-218-938-11	RES-CHIP	56	5%	1/16W
R1363	1-218-965-11	RES-CHIP	10K	5%	1/16W
R1364	1-218-965-11	RES-CHIP	10K	5%	1/16W
R1366	1-218-965-11	RES-CHIP	10K	5%	1/16W
R1382	1-216-803-11	METAL CHIP	33	5%	1/10W
R1383	1-216-803-11	METAL CHIP	33	5%	1/10W
R1384	1-216-803-11	METAL CHIP	33	5%	1/10W
R1385	1-216-803-11	METAL CHIP	33	5%	1/10W
R1386	1-216-803-11	METAL CHIP	33	5%	1/10W
R1387	1-216-803-11	METAL CHIP	33	5%	1/10W
R1388	1-216-803-11	METAL CHIP	33	5%	1/10W
R1389	1-216-803-11	METAL CHIP	33	5%	1/10W
R1390	1-216-803-11	METAL CHIP	33	5%	1/10W
R1391	1-216-803-11	METAL CHIP	33	5%	1/10W
R1392	1-216-803-11	METAL CHIP	33	5%	1/10W
R1393	1-218-937-11	RES-CHIP	47	5%	1/16W
R1395	1-218-937-11	RES-CHIP	47	5%	1/16W
R1396	1-218-990-11	SHORT CHIP	0		
R1446	1-218-965-11	RES-CHIP	10K	5%	1/16W
R1466	1-218-935-11	RES-CHIP	33	5%	1/16W
R1470	1-218-938-11	RES-CHIP	56	5%	1/16W
R1472	1-218-965-11	RES-CHIP	10K	5%	1/16W
R1474	1-218-937-11	RES-CHIP	47	5%	1/16W
R1508	1-218-941-81	RES-CHIP	100	5%	1/16W
R1512	1-218-990-11	SHORT CHIP	0		
R1603	1-218-941-81	RES-CHIP	100	5%	1/16W
R1604	1-218-965-11	RES-CHIP	10K	5%	1/16W
R1704	1-218-935-11	RES-CHIP	33	5%	1/16W
R1705	1-218-935-11	RES-CHIP	33	5%	1/16W
R1706	1-218-935-11	RES-CHIP	33	5%	1/16W
R1707	1-218-935-11	RES-CHIP	33	5%	1/16W
R1709	1-218-961-11	RES-CHIP	4.7K	5%	1/16W
R1710	1-218-938-11	RES-CHIP	56	5%	1/16W
R1712	1-218-961-11	RES-CHIP	4.7K	5%	1/16W
R1713	1-218-938-11	RES-CHIP	56	5%	1/16W
R1714	1-218-935-11	RES-CHIP	33	5%	1/16W
R1716	1-218-935-11	RES-CHIP	33	5%	1/16W
R1717	1-218-939-11	RES-CHIP	68	5%	1/16W
R1720	1-218-961-11	RES-CHIP	4.7K	5%	1/16W
R1721	1-218-961-11	RES-CHIP	4.7K	5%	1/16W
R1729	1-218-961-11	RES-CHIP	4.7K	5%	1/16W
R1730	1-218-940-11	RES-CHIP	82	5%	1/16W
R1732	1-218-961-11	RES-CHIP	4.7K	5%	1/16W
R1733	1-218-940-11	RES-CHIP	82	5%	1/16W

Ref. No.	Part No.	Description			Remarks
R1735	1-218-961-11	RES-CHIP	4.7K	5%	1/16W
R1736	1-218-939-11	RES-CHIP	68	5%	1/16W
R1738	1-218-961-11	RES-CHIP	4.7K	5%	1/16W
R1739	1-218-938-11	RES-CHIP	56	5%	1/16W
R1741	1-218-961-11	RES-CHIP	4.7K	5%	1/16W
R1742	1-218-939-11	RES-CHIP	68	5%	1/16W
R1744	1-218-961-11	RES-CHIP	4.7K	5%	1/16W
R1745	1-218-940-11	RES-CHIP	82	5%	1/16W
R1747	1-218-961-11	RES-CHIP	4.7K	5%	1/16W
R1748	1-218-939-11	RES-CHIP	68	5%	1/16W
R1753	1-216-819-11	METAL CHIP	680	5%	1/10W
R1803	1-216-821-11	METAL CHIP	1K	5%	1/10W
R1804	1-216-821-11	METAL CHIP	1K	5%	1/10W
R1810	1-216-817-11	METAL CHIP	470	5%	1/10W
R1818	1-216-821-11	METAL CHIP	1K	5%	1/10W
R1901	1-218-990-11	SHORT CHIP	0		
R1903	1-218-990-11	SHORT CHIP	0		
R1904	1-216-295-91	SHORT CHIP	0		
R1905	1-218-990-11	SHORT CHIP	0		
R1906	1-218-990-11	SHORT CHIP	0		
R1907	1-218-990-11	SHORT CHIP	0		
R1908	1-218-990-11	SHORT CHIP	0		
R1909	1-218-990-11	SHORT CHIP	0		
R1910	1-218-990-11	SHORT CHIP	0		
R1911	1-218-990-11	SHORT CHIP	0		
R1912	1-218-990-11	SHORT CHIP	0		
R1913	1-218-990-11	SHORT CHIP	0		
R1914	1-218-990-11	SHORT CHIP	0		
R1915	1-218-990-11	SHORT CHIP	0		
R1916	1-218-990-11	SHORT CHIP	0		
R1917	1-218-990-11	SHORT CHIP	0		
R1918	1-216-864-11	SHORT CHIP	0		
R1919	1-216-864-11	SHORT CHIP	0		
R1922	1-218-990-11	SHORT CHIP	0		
R2101	1-218-990-11	SHORT CHIP	0		
R2107	1-216-864-11	SHORT CHIP	0		
R2115	1-218-937-11	RES-CHIP	47	5%	1/16W
R2138	1-218-965-11	RES-CHIP	10K	5%	1/16W
R2139	1-218-965-11	RES-CHIP	10K	5%	1/16W
R2140	1-218-939-11	RES-CHIP	68	5%	1/16W
R2141	1-218-939-11	RES-CHIP	68	5%	1/16W
R2142	1-218-939-11	RES-CHIP	68	5%	1/16W
R2143	1-218-965-11	RES-CHIP	10K	5%	1/16W
R2144	1-218-939-11	RES-CHIP	68	5%	1/16W
R2145	1-218-965-11	RES-CHIP	10K	5%	1/16W
R2146	1-218-965-11	RES-CHIP	10K	5%	1/16W
R2147	1-218-965-11	RES-CHIP	10K	5%	1/16W
R2151	1-218-938-11	RES-CHIP	56	5%	1/16W
R2152	1-218-965-11	RES-CHIP	10K	5%	1/16W
R2153	1-218-937-11	RES-CHIP	47	5%	1/16W
R2154	1-218-965-11	RES-CHIP	10K	5%	1/16W
R2155	1-218-937-11	RES-CHIP	47	5%	1/16W
R2156	1-218-965-11	RES-CHIP	10K	5%	1/16W
R2157	1-218-965-11	RES-CHIP	10K	5%	1/16W
R2158	1-218-973-11	RES-CHIP	47K	5%	1/16W
R2159	1-218-973-11	RES-CHIP	47K	5%	1/16W
R2162	1-208-927-11	METAL CHIP	47K	0.5%	1/16W
R2163	1-208-927-11	METAL CHIP	47K	0.5%	1/16W
R2164	1-208-927-11	METAL CHIP	47K	0.5%	1/16W
R2167	1-218-942-11	RES-CHIP	120	5%	1/16W

Ref. No.	Part No.	Description			Remarks
R2175	1-218-965-11	RES-CHIP	10K	5%	1/16W
R2176	1-218-965-11	RES-CHIP	10K	5%	1/16W
R2177	1-218-965-11	RES-CHIP	10K	5%	1/16W
R2178	1-218-965-11	RES-CHIP	10K	5%	1/16W
R2179	1-218-965-11	RES-CHIP	10K	5%	1/16W
R2180	1-218-965-11	RES-CHIP	10K	5%	1/16W
R2181	1-218-965-11	RES-CHIP	10K	5%	1/16W
R2182	1-218-965-11	RES-CHIP	10K	5%	1/16W
R2183	1-218-965-11	RES-CHIP	10K	5%	1/16W
R2184	1-218-965-11	RES-CHIP	10K	5%	1/16W
R2185	1-218-965-11	RES-CHIP	10K	5%	1/16W
R2188	1-216-168-00	RES-CHIP	56	5%	1/8W
R2190	1-218-965-11	RES-CHIP	10K	5%	1/16W
R2191	1-218-965-11	RES-CHIP	10K	5%	1/16W
R2193	1-218-957-11	RES-CHIP	2.2K	5%	1/16W
R2194	1-218-935-11	RES-CHIP	33	5%	1/16W
R2195	1-208-949-11	METAL CHIP	390K	0.5%	1/16W
R2196	1-218-985-11	METAL CHIP	470K	5%	1/16W
R2205	1-218-965-11	RES-CHIP	10K	5%	1/16W
R2206	1-218-953-11	RES-CHIP	1K	5%	1/16W
R2209	1-218-965-11	RES-CHIP	10K	5%	1/16W
R2210	1-218-965-11	RES-CHIP	10K	5%	1/16W
R2211	1-218-965-11	RES-CHIP	10K	5%	1/16W
R2212	1-218-965-11	RES-CHIP	10K	5%	1/16W
R2213	1-218-965-11	RES-CHIP	10K	5%	1/16W
R2214	1-218-965-11	RES-CHIP	10K	5%	1/16W
R2216	1-208-910-11	METAL CHIP	9.1K	0.5%	1/16W
R2217	1-218-938-11	METAL CHIP	56	5%	1/16W
R2218	1-218-938-11	METAL CHIP	56	5%	1/16W
R2220	1-218-938-11	METAL CHIP	56	5%	1/16W
R2221	1-218-938-11	METAL CHIP	56	5%	1/16W
R2222	1-218-864-11	METAL CHIP	5.1K	0.5%	1/16W
R2224	1-216-864-11	SHORT CHIP	0		
R2225	1-216-864-11	SHORT CHIP	0		
R2227	1-218-990-11	SHORT CHIP	0		
R3102	1-218-938-11	RES-CHIP	56	5%	1/16W
R3103	1-218-938-11	RES-CHIP	56	5%	1/16W
R3104	1-218-937-11	RES-CHIP	47	5%	1/16W
R3107	1-218-935-11	RES-CHIP	33	5%	1/16W
R3110	1-218-938-11	RES-CHIP	56	5%	1/16W
R3111	1-218-938-11	RES-CHIP	56	5%	1/16W
R3112	1-218-965-11	RES-CHIP	10K	5%	1/16W
R3118	1-218-965-11	RES-CHIP	10K	5%	1/16W
R3119	1-218-938-11	RES-CHIP	56	5%	1/16W
R3122	1-218-941-81	RES-CHIP	100	5%	1/16W
R3123	1-218-935-11	RES-CHIP	33	5%	1/16W
R3125	1-218-955-11	RES-CHIP	1.5K	5%	1/16W
R3126	1-218-938-11	RES-CHIP	56	5%	1/16W
R3127	1-218-965-11	RES-CHIP	10K	5%	1/16W
R3128	1-218-936-11	RES-CHIP	39	5%	1/16W
R3135	1-218-990-11	SHORT CHIP	0		
R3136	1-218-965-11	RES-CHIP	10K	5%	1/16W
R3140	1-218-965-11	RES-CHIP	10K	5%	1/16W
R3143	1-218-961-11	RES-CHIP	4.7K	5%	1/16W
R3150	1-218-965-11	RES-CHIP	10K	5%	1/16W
R3153	1-218-961-11	RES-CHIP	4.7K	5%	1/16W
R3155	1-218-961-11	RES-CHIP	4.7K	5%	1/16W
R3156	1-218-938-11	RES-CHIP	56	5%	1/16W
R3157	1-218-965-11	RES-CHIP	10K	5%	1/16W
R3159	1-218-937-11	RES-CHIP	47	5%	1/16W
R3160	1-218-961-11	RES-CHIP	4.7K	5%	1/16W
R3163	1-218-938-11	RES-CHIP	56	5%	1/16W
R3165	1-218-938-11	RES-CHIP	56	5%	1/16W
R3166	1-218-965-11	RES-CHIP	10K	5%	1/16W
R3167	1-218-937-11	RES-CHIP	47	5%	1/16W
R3168	1-218-961-11	RES-CHIP	4.7K	5%	1/16W
R3170	1-218-938-11	RES-CHIP	56	5%	1/16W
R3172	1-218-938-11	RES-CHIP	56	5%	1/16W
R3173	1-218-965-11	RES-CHIP	10K	5%	1/16W
R3177	1-218-939-11	RES-CHIP	68	5%	1/16W
R3178	1-218-937-11	RES-CHIP	47	5%	1/16W
R3179	1-218-961-11	RES-CHIP	4.7K	5%	1/16W
R3180	1-218-938-11	RES-CHIP	56	5%	1/16W
R3181	1-218-965-11	RES-CHIP	10K	5%	1/16W
R3182	1-218-937-11	RES-CHIP	47	5%	1/16W
R3183	1-218-961-11	RES-CHIP	4.7K	5%	1/16W
R3186	1-218-938-11	RES-CHIP	56	5%	1/16W
R3187	1-218-965-11	RES-CHIP	10K	5%	1/16W
R3189	1-218-965-11	RES-CHIP	10K	5%	1/16W
R3194	1-218-939-11	RES-CHIP	68	5%	1/16W
R3195	1-218-965-11	RES-CHIP	10K	5%	1/16W
R3198	1-218-937-11	RES-CHIP	47	5%	1/16W
R3199	1-218-961-11	RES-CHIP	4.7K	5%	1/16W
R3201	1-218-938-11	RES-CHIP	56	5%	1/16W
R3202	1-218-965-11	RES-CHIP	10K	5%	1/16W
R3203	1-218-937-11	RES-CHIP	47	5%	1/16W
R3204	1-218-961-11	RES-CHIP	4.7K	5%	1/16W
R3205	1-218-937-11	RES-CHIP	47	5%	1/16W
R3206	1-218-961-11	RES-CHIP	4.7K	5%	1/16W
R3207	1-218-938-11	RES-CHIP	56	5%	1/16W
R3208	1-218-965-11	RES-CHIP	10K	5%	1/16W
R3211	1-218-938-11	RES-CHIP	56	5%	1/16W
R3212	1-218-965-11	RES-CHIP	10K	5%	1/16W
R3215	1-218-937-11	RES-CHIP	47	5%	1/16W
R3216	1-218-937-11	RES-CHIP	47	5%	1/16W
R3217	1-218-935-11	RES-CHIP	33	5%	1/16W
R3218	1-218-935-11	RES-CHIP	33	5%	1/16W
R3219	1-218-933-11	RES-CHIP	22	5%	1/16W
R3220	1-218-935-11	RES-CHIP	33	5%	1/16W
R3221	1-218-933-11	RES-CHIP	22	5%	1/16W
R3222	1-218-933-11	RES-CHIP	22	5%	1/16W
R3223	1-218-961-11	RES-CHIP	4.7K	5%	1/16W
R3224	1-218-961-11	RES-CHIP	4.7K	5%	1/16W
R3225	1-218-961-11	RES-CHIP	4.7K	5%	1/16W
R3226	1-218-961-11	RES-CHIP	4.7K	5%	1/16W
R3227	1-218-961-11	RES-CHIP	4.7K	5%	1/16W
R3228	1-218-961-11	RES-CHIP	4.7K	5%	1/16W
R3229	1-218-961-11	RES-CHIP	4.7K	5%	1/16W
R3230	1-218-961-11	RES-CHIP	4.7K	5%	1/16W
R3231	1-218-935-11	RES-CHIP	33	5%	1/16W
R3232	1-218-935-11	RES-CHIP	33	5%	1/16W
R3233	1-218-938-11	RES-CHIP	56	5%	1/16W
R3234	1-218-942-11	RES-CHIP	120	5%	1/16W
R3237	1-218-937-11	RES-CHIP	47	5%	1/16W
R3238	1-218-990-11	SHORT CHIP	0		
R3250	1-218-935-11	RES-CHIP	33	5%	1/16W
R3251	1-218-939-11	RES-CHIP	68	5%	1/16W
R3252	1-218-933-11	RES-CHIP	22	5%	1/16W
R3267	1-218-949-11	RES-CHIP	470	5%	1/16W
R3268	1-218-990-11	SHORT CHIP	0		

Ref. No.	Part No.	Description			Remarks
R3270	1-218-939-11	RES-CHIP	68	5%	1/16W
R3272	1-218-965-11	RES-CHIP	10K	5%	1/16W
R3273	1-218-965-11	RES-CHIP	10K	5%	1/16W
R3274	1-218-965-11	RES-CHIP	10K	5%	1/16W
R3280	1-218-965-11	RES-CHIP	10K	5%	1/16W
R3281	1-218-965-11	RES-CHIP	10K	5%	1/16W
R3282	1-218-990-11	SHORT CHIP	0		
R3283	1-218-965-11	RES-CHIP	10K	5%	1/16W
R3287	1-218-939-11	RES-CHIP	68	5%	1/16W
R3293	1-218-937-11	RES-CHIP	47	5%	1/16W
R3294	1-218-937-11	RES-CHIP	47	5%	1/16W
R3295	1-218-990-11	SHORT CHIP	0		
R3296	1-218-965-11	RES-CHIP	10K	5%	1/16W
R3297	1-218-938-11	RES-CHIP	56	5%	1/16W
R3298	1-218-938-11	RES-CHIP	56	5%	1/16W
R3299	1-218-937-11	RES-CHIP	47	5%	1/16W
R3301	1-218-938-11	RES-CHIP	56	5%	1/16W
R3302	1-218-938-11	RES-CHIP	56	5%	1/16W
R3304	1-218-938-11	RES-CHIP	56	5%	1/16W
R3305	1-218-938-11	RES-CHIP	56	5%	1/16W
R3306	1-218-938-11	RES-CHIP	56	5%	1/16W
R3307	1-218-938-11	RES-CHIP	56	5%	1/16W
R3308	1-218-935-11	RES-CHIP	33	5%	1/16W
R3313	1-216-864-11	SHORT CHIP	0		
R3315	1-218-990-11	SHORT CHIP	0		
R3316	1-218-938-11	RES-CHIP	56	5%	1/16W
R3317	1-218-938-11	RES-CHIP	56	5%	1/16W
R3318	1-218-939-11	RES-CHIP	68	5%	1/16W
R3319	1-218-935-11	RES-CHIP	33	5%	1/16W
R3504	1-218-965-11	RES-CHIP	10K	5%	1/16W
R3507	1-218-990-11	SHORT CHIP	0		
R3512	1-218-965-11	RES-CHIP	10K	5%	1/16W
R3513	1-218-965-11	RES-CHIP	10K	5%	1/16W
R3514	1-218-965-11	RES-CHIP	10K	5%	1/16W
R3520	1-218-965-11	RES-CHIP	10K	5%	1/16W
R3529	1-218-965-11	RES-CHIP	10K	5%	1/16W
R3530	1-218-965-11	RES-CHIP	10K	5%	1/16W
R3534	1-216-864-11	SHORT CHIP	0		
R3535	1-218-965-11	RES-CHIP	10K	5%	1/16W
R3537	1-218-965-11	RES-CHIP	10K	5%	1/16W
R3538	1-218-965-11	RES-CHIP	10K	5%	1/16W
R3540	1-218-965-11	RES-CHIP	10K	5%	1/16W
R3810	1-218-990-11	SHORT CHIP	0		
R3811	1-218-935-11	RES-CHIP	33	5%	1/16W
R3812	1-218-935-11	RES-CHIP	33	5%	1/16W
R3813	1-218-935-11	RES-CHIP	33	5%	1/16W
R3814	1-218-935-11	RES-CHIP	33	5%	1/16W
R3822	1-218-990-11	SHORT CHIP	0		
R3823	1-218-990-11	SHORT CHIP	0		
R3824	1-218-990-11	SHORT CHIP	0		
R3825	1-218-935-11	RES-CHIP	33	5%	1/16W
R3827	1-218-965-11	RES-CHIP	10K	5%	1/16W
R4104	1-218-953-11	RES-CHIP	1K	5%	1/16W
R4111	1-218-929-11	RES-CHIP	10	5%	1/16W
R4302	1-218-990-11	SHORT CHIP	0		
R4310	1-218-965-11	RES-CHIP	10K	5%	1/16W
R4311	1-218-965-11	RES-CHIP	10K	5%	1/16W
R4312	1-218-965-11	RES-CHIP	10K	5%	1/16W
R4313	1-218-935-11	RES-CHIP	33	5%	1/16W
R4314	1-218-935-11	RES-CHIP	33	5%	1/16W

Ref. No.	Part No.	Description			Remarks
R4317	1-218-965-11	RES-CHIP	10K	5%	1/16W
R4319	1-218-937-11	RES-CHIP	47	5%	1/16W
R4320	1-218-937-11	RES-CHIP	47	5%	1/16W
R4321	1-218-937-11	RES-CHIP	47	5%	1/16W
R4322	1-218-937-11	RES-CHIP	47	5%	1/16W
R4329	1-218-935-11	RES-CHIP	33	5%	1/16W
R4331	1-218-935-11	RES-CHIP	33	5%	1/16W
R4332	1-218-935-11	RES-CHIP	33	5%	1/16W
R4334	1-218-935-11	RES-CHIP	33	5%	1/16W
R4335	1-218-935-11	RES-CHIP	33	5%	1/16W
R4336	1-218-935-11	RES-CHIP	33	5%	1/16W
R4337	1-218-935-11	RES-CHIP	33	5%	1/16W
R4338	1-218-929-11	RES-CHIP	10	5%	1/16W
R4339	1-218-935-11	RES-CHIP	33	5%	1/16W
R4340	1-218-929-11	RES-CHIP	10	5%	1/16W
R4341	1-218-935-11	RES-CHIP	33	5%	1/16W
R4342	1-218-929-11	RES-CHIP	10	5%	1/16W
R4343	1-218-929-11	RES-CHIP	10	5%	1/16W
R4344	1-218-935-11	RES-CHIP	33	5%	1/16W
R4349	1-218-953-11	RES-CHIP	1K	5%	1/16W
R4350	1-218-953-11	RES-CHIP	1K	5%	1/16W
R4351	1-218-990-11	SHORT CHIP	0		
R4352	1-218-990-11	SHORT CHIP	0		
R4353	1-216-864-11	SHORT CHIP	0		
R5202	1-218-933-11	RES-CHIP	22	5%	1/16W
R5207	1-218-929-11	RES-CHIP	10	5%	1/16W
R5208	1-218-961-11	RES-CHIP	4.7K	5%	1/16W
R5210	1-218-939-11	RES-CHIP	68	5%	1/16W
R5211	1-218-965-11	RES-CHIP	10K	5%	1/16W
R5212	1-218-938-11	RES-CHIP	56	5%	1/16W
R5213	1-218-939-11	RES-CHIP	68	5%	1/16W
R5215	1-218-937-11	RES-CHIP	47	5%	1/16W

< COMPOSITION CIRCUIT BLOCK >

RB103	1-242-963-21	RES, NETWORK 33	(1005X4)
RB104	1-234-714-11	RES, NETWORK 56	(1005X4)
RB105	1-242-963-21	RES, NETWORK 33	(1005X4)
RB107	1-242-963-21	RES, NETWORK 33	(1005X4)
RB108	1-242-963-21	RES, NETWORK 33	(1005X4)
RB109	1-242-963-21	RES, NETWORK 33	(1005X4)
RB110	1-242-963-21	RES, NETWORK 33	(1005X4)
RB111	1-242-963-21	RES, NETWORK 33	(1005X4)
RB112	1-242-963-21	RES, NETWORK 33	(1005X4)
RB113	1-242-963-21	RES, NETWORK 33	(1005X4)
RB114	1-242-963-21	RES, NETWORK 33	(1005X4)
RB115	1-242-963-21	RES, NETWORK 33	(1005X4)
RB116	1-242-963-21	RES, NETWORK 33	(1005X4)
RB117	1-242-963-21	RES, NETWORK 33	(1005X4)
RB121	1-234-378-21	RES, NETWORK 10K	(1005X4)
RB122	1-234-377-21	RES, NETWORK 4.7K	(1005X4)
RB123	1-234-377-21	RES, NETWORK 4.7K	(1005X4)
RB124	1-234-377-21	RES, NETWORK 4.7K	(1005X4)
RB125	1-234-377-21	RES, NETWORK 4.7K	(1005X4)
RB126	1-234-377-21	RES, NETWORK 4.7K	(1005X4)
RB127	1-234-377-21	RES, NETWORK 4.7K	(1005X4)
RB128	1-234-377-21	RES, NETWORK 4.7K	(1005X4)
RB129	1-234-377-21	RES, NETWORK 4.7K	(1005X4)
RB130	1-234-372-21	RES, NETWORK 100	(1005X4)
RB131	1-234-372-21	RES, NETWORK 100	(1005X4)

Ref. No.	Part No.	Description	Remarks
RB132	1-234-378-21	RES, NETWORK 10K	(1005X4)
RB301	1-234-378-21	RES, NETWORK 10K	(1005X4)
RB302	1-234-378-21	RES, NETWORK 10K	(1005X4)
RB303	1-234-378-21	RES, NETWORK 10K	(1005X4)
RB304	1-234-378-21	RES, NETWORK 10K	(1005X4)
RB305	1-234-371-21	RES, NETWORK 47	(1005X4)
RB306	1-234-371-21	RES, NETWORK 47	(1005X4)
RB307	1-234-371-21	RES, NETWORK 47	(1005X4)
RB308	1-234-371-21	RES, NETWORK 47	(1005X4)
RB309	1-234-714-11	RES, NETWORK 56	(1005X4)
RB310	1-234-714-11	RES, NETWORK 56	(1005X4)
RB311	1-234-714-11	RES, NETWORK 56	(1005X4)
RB312	1-234-371-21	RES, NETWORK 47	(1005X4)
RB313	1-234-378-21	RES, NETWORK 10K	(1005X4)
RB314	1-234-378-21	RES, NETWORK 10K	(1005X4)
RB315	1-234-378-21	RES, NETWORK 10K	(1005X4)
RB316	1-234-378-21	RES, NETWORK 10K	(1005X4)
RB317	1-234-378-21	RES, NETWORK 10K	(1005X4)
RB318	1-234-702-11	RES, NETWORK 68	(1005X4)
RB319	1-234-702-11	RES, NETWORK 68	(1005X4)
RB320	1-234-702-11	RES, NETWORK 68	(1005X4)
RB321	1-234-702-11	RES, NETWORK 68	(1005X4)
RB322	1-234-378-21	RES, NETWORK 10K	(1005X4)
RB323	1-234-378-21	RES, NETWORK 10K	(1005X4)
RB326	1-234-714-11	RES, NETWORK 56	(1005X4)
RB328	1-242-963-21	RES, NETWORK 33	(1005X4)
RB329	1-242-963-21	RES, NETWORK 33	(1005X4)
RB330	1-234-714-11	RES, NETWORK 56	(1005X4)
RB331	1-234-714-11	RES, NETWORK 56	(1005X4)
RB332	1-234-378-21	RES, NETWORK 10K	(1005X4)
RB333	1-234-378-21	RES, NETWORK 10K	(1005X4)
RB336	1-234-378-21	RES, NETWORK 10K	(1005X4)
RB337	1-234-378-21	RES, NETWORK 10K	(1005X4)
RB338	1-234-378-21	RES, NETWORK 10K	(1005X4)
RB339	1-234-378-21	RES, NETWORK 10K	(1005X4)
RB352	1-242-963-21	RES, NETWORK 33	(1005X4)
RB353	1-242-963-21	RES, NETWORK 33	(1005X4)
RB354	1-242-963-21	RES, NETWORK 33	(1005X4)
RB355	1-242-963-21	RES, NETWORK 33	(1005X4)
RB356	1-234-378-21	RES, NETWORK 10K	(1005X4)
RB357	1-234-378-21	RES, NETWORK 10K	(1005X4)
RB358	1-234-378-21	RES, NETWORK 10K	(1005X4)
RB359	1-234-378-21	RES, NETWORK 10K	(1005X4)
RB360	1-234-378-21	RES, NETWORK 10K	(1005X4)
RB361	1-234-378-21	RES, NETWORK 10K	(1005X4)
RB382	1-234-378-21	RES, NETWORK 10K	(1005X4)
RB383	1-234-702-11	RES, NETWORK 68	(1005X4)
RB384	1-234-702-11	RES, NETWORK 68	(1005X4)
RB385	1-234-371-21	RES, NETWORK 47	(1005X4)
RB386	1-234-371-21	RES, NETWORK 47	(1005X4)
RB387	1-234-702-11	RES, NETWORK 68	(1005X4)
RB388	1-234-702-11	RES, NETWORK 68	(1005X4)
RB389	1-234-702-11	RES, NETWORK 68	(1005X4)
RB390	1-234-702-11	RES, NETWORK 68	(1005X4)
RB403	1-234-378-21	RES, NETWORK 10K	(1005X4)
RB404	1-234-378-21	RES, NETWORK 10K	(1005X4)
RB701	1-234-370-21	RES, NETWORK 22	(1005X4)
RB702	1-234-370-21	RES, NETWORK 22	(1005X4)
RB801	1-234-400-21	CONDUCTOR, NETWORK	(2010X4)
RB802	1-234-400-21	CONDUCTOR, NETWORK	(2010X4)
RB803	1-242-963-21	RES, NETWORK 33	(1005X4)
RB804	1-242-963-21	RES, NETWORK 33	(1005X4)
RB807	1-242-963-21	RES, NETWORK 33	(1005X4)
RB808	1-242-963-21	RES, NETWORK 33	(1005X4)
RB809	1-242-963-21	RES, NETWORK 33	(1005X4)
RB810	1-242-963-21	RES, NETWORK 33	(1005X4)
RB901	1-234-377-21	RES, NETWORK 4.7K	(1005X4)
RB902	1-234-371-21	RES, NETWORK 47	(1005X4)
RB903	1-234-371-21	RES, NETWORK 47	(1005X4)
RB904	1-242-963-21	RES, NETWORK 33	(1005X4)
RB905	1-242-963-21	RES, NETWORK 33	(1005X4)
RB906	1-234-378-21	RES, NETWORK 10K	(1005X4)
RB1101	1-242-963-21	RES, NETWORK 33	(1005X4)
RB1102	1-242-963-21	RES, NETWORK 33	(1005X4)
RB1103	1-242-963-21	RES, NETWORK 33	(1005X4)
RB1104	1-242-963-21	RES, NETWORK 33	(1005X4)
RB1105	1-242-963-21	RES, NETWORK 33	(1005X4)
RB1106	1-242-963-21	RES, NETWORK 33	(1005X4)
RB1107	1-242-963-21	RES, NETWORK 33	(1005X4)
RB1108	1-242-963-21	RES, NETWORK 33	(1005X4)
RB1109	1-242-963-21	RES, NETWORK 33	(1005X4)
RB1110	1-242-963-21	RES, NETWORK 33	(1005X4)
RB1121	1-234-371-21	RES, NETWORK 47	(1005X4)
RB1122	1-234-371-21	RES, NETWORK 47	(1005X4)
RB1123	1-242-963-21	RES, NETWORK 33	(1005X4)
RB1124	1-242-963-21	RES, NETWORK 33	(1005X4)
RB1125	1-242-963-21	RES, NETWORK 33	(1005X4)
RB1126	1-242-963-21	RES, NETWORK 33	(1005X4)
RB1201	1-234-371-21	RES, NETWORK 47	(1005X4)
RB1202	1-234-371-21	RES, NETWORK 47	(1005X4)
RB1203	1-234-400-21	CONDUCTOR, NETWORK	(2010X4)
RB1204	1-234-400-21	CONDUCTOR, NETWORK	(2010X4)
RB1205	1-234-400-21	CONDUCTOR, NETWORK	(2010X4)
RB1206	1-234-400-21	CONDUCTOR, NETWORK	(2010X4)
RB1307	1-234-702-11	RES, NETWORK 68	(1005X4)
RB1308	1-234-702-11	RES, NETWORK 68	(1005X4)
RB1309	1-234-702-11	RES, NETWORK 68	(1005X4)
RB1310	1-234-702-11	RES, NETWORK 68	(1005X4)
RB1311	1-234-371-21	RES, NETWORK 47	(1005X4)
RB1312	1-234-371-21	RES, NETWORK 47	(1005X4)
RB1313	1-242-963-21	RES, NETWORK 33	(1005X4)
RB1314	1-242-963-21	RES, NETWORK 33	(1005X4)
RB1316	1-234-371-21	RES, NETWORK 47	(1005X4)
RB1317	1-234-702-11	RES, NETWORK 68	(1005X4)
RB1318	1-234-702-11	RES, NETWORK 68	(1005X4)
RB1319	1-234-371-21	RES, NETWORK 47	(1005X4)
RB1320	1-234-371-21	RES, NETWORK 47	(1005X4)
RB1321	1-234-371-21	RES, NETWORK 47	(1005X4)
RB1322	1-234-371-21	RES, NETWORK 47	(1005X4)
RB1323	1-234-371-21	RES, NETWORK 47	(1005X4)
RB1324	1-234-371-21	RES, NETWORK 47	(1005X4)
RB1325	1-234-371-21	RES, NETWORK 47	(1005X4)
RB1326	1-234-371-21	RES, NETWORK 47	(1005X4)
RB1327	1-234-371-21	RES, NETWORK 47	(1005X4)
RB1328	1-234-371-21	RES, NETWORK 47	(1005X4)
RB1329	1-234-371-21	RES, NETWORK 47	(1005X4)
RB1330	1-234-371-21	RES, NETWORK 47	(1005X4)
RB1331	1-234-371-21	RES, NETWORK 47	(1005X4)
RB1332	1-234-371-21	RES, NETWORK 47	(1005X4)
RB1333	1-234-371-21	RES, NETWORK 47	(1005X4)

Ref. No.	Part No.	Description				Remarks
RB1334	1-234-371-21	RES, NETWORK 47	(1005X4)			
RB2102	1-234-702-11	RES, NETWORK 68	(1005X4)			
RB2103	1-234-702-11	RES, NETWORK 68	(1005X4)			
RB2104	1-234-378-21	RES, NETWORK 10K	(1005X4)			
RB2106	1-234-378-21	RES, NETWORK 10K	(1005X4)			
RB2107	1-234-378-21	RES, NETWORK 10K	(1005X4)			
RB2108	1-234-378-21	RES, NETWORK 10K	(1005X4)			
RB2109	1-234-378-21	RES, NETWORK 10K	(1005X4)			
RB2110	1-234-378-21	RES, NETWORK 10K	(1005X4)			
RB2111	1-234-378-21	RES, NETWORK 10K	(1005X4)			
RB2112	1-234-378-21	RES, NETWORK 10K	(1005X4)			
RB2113	1-234-378-21	RES, NETWORK 10K	(1005X4)			
RB2114	1-234-378-21	RES, NETWORK 10K	(1005X4)			
RB2115	1-234-378-21	RES, NETWORK 10K	(1005X4)			
RB2116	1-234-378-21	RES, NETWORK 10K	(1005X4)			
RB2117	1-234-378-21	RES, NETWORK 10K	(1005X4)			
RB2118	1-234-378-21	RES, NETWORK 10K	(1005X4)			
		< THERMISTOR >				
TH1901	1-803-384-11	THERMISTOR (1608)				
		< VIBRATOR >				
X102	1-795-885-21	VIBRATOR, CRYSTAL (SMD)				
X701	1-795-545-21	VIBRATOR, CRYSTAL(SMD,14.31818MHz)				
X1701	1-781-867-21	VIBRATOR, CRYSTAL				
X2201	1-795-886-21	VIBRATOR, CRYSTAL (SMD)				
*	A-1077-051-A	AV-92 (UH) BOARD COMPL				
		**********				
		(REF.NO.;10,000 SERIES)				
		< CAPACITOR >				
C103	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V	
C104	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V	
C105	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V	
C108	1-127-573-11	CERAMIC CHIP	1uF	10%	16V	
C109	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V	
C110	1-126-947-11	ELECT	47uF	20%	35V	
C112	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V	
C113	1-126-947-11	ELECT	47uF	20%	35V	
C116	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V	
C117	1-127-573-11	CERAMIC CHIP	1uF	10%	16V	
C202	1-126-947-11	ELECT	47uF	20%	35V	
C203	1-126-947-11	ELECT	47uF	20%	35V	
C204	1-126-947-11	ELECT	47uF	20%	35V	
C205	1-107-714-11	ELECT	10uF	20%	50V	
C206	1-126-963-11	ELECT	4.7uF	20.00%	50V	
C208	1-126-963-11	ELECT	4.7uF	20.00%	50V	
C209	1-126-947-11	ELECT	47uF	20%	35V	
C210	1-126-947-11	ELECT	47uF	20%	35V	
C211	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V	
C212	1-126-947-11	ELECT	47uF	20%	35V	
C213	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V	
C214	1-126-947-11	ELECT	47uF	20%	35V	
C215	1-126-961-11	ELECT	2.2uF	20%	50V	
C216	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V	
C217	1-107-714-11	ELECT	10uF	20%	50V	
C218	1-104-660-91	ELECT	47uF	20%	35V	
C219	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V	
C301	1-126-947-11	ELECT	47uF	20%	35V	
C302	1-126-947-11	ELECT	47uF	20%	35V	
C304	1-126-947-11	ELECT	47uF	20%	35V	
C306	1-126-947-11	ELECT	47uF	20%	35V	
C307	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V	
C308	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V	
C309	1-104-660-91	ELECT	47uF	20.00%	16V	
C310	1-164-217-11	CERAMIC CHIP	150PF	5%	50V	
C311	1-164-217-11	CERAMIC CHIP	150PF	5%	50V	
C312	1-164-739-11	CERAMIC CHIP	560PF	5%	50V	
C313	1-164-739-11	CERAMIC CHIP	560PF	5%	50V	
C314	1-164-218-11	CERAMIC CHIP	180PF	5%	50V	
C315	1-164-218-11	CERAMIC CHIP	180PF	5%	50V	
C316	1-126-947-11	ELECT	47uF	20%	35V	
C317	1-126-947-11	ELECT	47uF	20%	35V	
C318	1-126-934-11	ELECT	220uF	20%	16V	
C319	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V	
C320	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V	
C321	1-126-960-11	ELECT	1uF	20.00%	50V	
C324	1-126-947-11	ELECT	47uF	20%	35V	
C326	1-162-927-11	CERAMIC CHIP	100PF	5.00%	50V	
C327	1-162-927-11	CERAMIC CHIP	100PF	5.00%	50V	
C328	1-126-947-11	ELECT	47uF	20%	35V	
C329	1-162-927-11	CERAMIC CHIP	100PF	5.00%	50V	
C330	1-162-927-11	CERAMIC CHIP	100PF	5.00%	50V	
C333	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V	
C403	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V	
C404	1-127-573-11	CERAMIC CHIP	1uF	10%	16V	
C405	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V	
C408	1-126-947-11	ELECT	47uF	20%	35V	
C413	1-126-947-11	ELECT	47uF	20%	35V	
C414	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V	
C415	1-125-838-11	CERAMIC CHIP	2.2uF	10%	6.3V	
C416	1-164-227-11	CERAMIC CHIP	0.022uF	10%	25V	
C417	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V	
C418	1-162-968-11	CERAMIC CHIP	0.0047uF	10%	50V	
C419	1-162-966-11	CERAMIC CHIP	0.0022uF	10%	50V	
C424	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V	
C426	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V	
C427	1-126-947-11	ELECT	47uF	20%	35V	
C428	1-126-947-11	ELECT	47uF	20%	35V	
C429	1-115-339-11	CERAMIC CHIP	0.1uF	10%	50V	
C430	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V	
C432	1-126-916-11	ELECT	1000uF	20%	6.3V	
C434	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V	
C435	1-126-947-11	ELECT	47uF	20%	35V	
C437	1-126-964-11	ELECT	10uF	20%	50V	
C439	1-115-339-11	CERAMIC CHIP	0.1uF	10%	50V	
C443	1-126-964-11	ELECT	10uF	20%	50V	
C602	1-126-947-11	ELECT	47uF	20%	35V	
C603	1-126-947-11	ELECT	47uF	20%	35V	
C604	1-115-416-11	CERAMIC CHIP	0.001uF	5.00%	25V	
C606	1-126-947-11	ELECT	47uF	20%	35V	
C607	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V	
C609	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V	
C610	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V	
C612	1-162-919-11	CERAMIC CHIP	22PF	5%	50V	
C613	1-162-918-11	CERAMIC CHIP	18PF	5%	50V	

Ref. No.	Part No.	Description			Remarks
C614	1-162-915-11	CERAMIC CHIP	10PF	0.5PF	50V
C615	1-162-915-11	CERAMIC CHIP	10PF	0.5PF	50V
C616	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C617	1-165-176-11	CERAMIC CHIP	0.047uF	10%	16V
C618	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C620	1-162-920-11	CERAMIC CHIP	27PF	5%	50V
C621	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C622	1-126-933-11	ELECT	100uF	20%	16V
C623	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C626	1-162-923-11	CERAMIC CHIP	47PF	5%	50V
C630	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C631	1-162-923-11	CERAMIC CHIP	47PF	5%	50V
C632	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C634	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C635	1-164-739-11	CERAMIC CHIP	560PF	5%	50V
C636	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C637	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C638	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C640	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C645	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C646	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C647	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C648	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C652	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C653	1-104-906-11	CAPACITOR	0.22F	5.5V	
C659	1-162-920-11	CERAMIC CHIP	27PF	5%	50V
C663	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C664	1-162-923-11	CERAMIC CHIP	47PF	5.00%	50V
C666	1-104-660-91	ELECT	47uF	20%	16V
C667	1-125-838-11	CERAMIC CHIP	2.2uF	10%	6.3V
C668	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C701	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C702	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C703	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C704	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C706	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C707	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C708	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C709	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C710	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C711	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C712	1-126-947-11	ELECT	47uF	20%	35V
C713	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C714	1-165-908-11	CERAMIC CHIP	1uF	10%	10V
C717	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C718	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C719	1-164-230-11	CERAMIC CHIP	220PF	5%	50V
C720	1-126-947-11	ELECT	47uF	20%	35V
C721	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C722	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C723	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C725	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C726	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C727	1-126-947-11	ELECT	47uF	20%	35V
C741	1-115-416-11	CERAMIC CHIP	0.001uF	5.00%	25V
C742	1-164-315-11	CERAMIC CHIP	470PF	5%	50V
C745	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C746	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C747	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C751	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V

Ref. No.	Part No.	Description			Remarks
C801	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C802	1-126-947-11	ELECT	47uF	20%	35V
C803	1-126-947-11	ELECT	47uF	20%	35V
C804	1-126-947-11	ELECT	47uF	20%	35V
C805	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C806	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C811	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C812	1-126-947-11	ELECT	47uF	20%	35V
C813	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C814	1-126-947-11	ELECT	47uF	20%	35V
C815	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C816	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C1101	1-163-021-91	CERAMIC CHIP	0.01uF	10%	50V
C1102	1-126-947-11	ELECT	47uF	20%	35V
C1103	1-126-947-11	ELECT	47uF	20%	35V
C1104	1-162-962-11	CERAMIC CHIP	470PF	10%	50V
C1107	1-162-927-11	CERAMIC CHIP	100PF	5%	50V
C1108	1-162-927-11	CERAMIC CHIP	100PF	5%	50V
CN101	1-778-317-11	CONNECTOR, BOARD TO BOARD 13P			
		< CONNECTOR >			
* CN102	1-564-705-11	PIN, CONNECTOR (SMALL TYPE) 3P			
CN501	1-784-326-11	CONNECTOR, FFC/FPC 27P			
CN502	1-778-274-11	CONNECTOR, FFC/FPC 13P			
CN503	1-774-769-11	CONNECTOR, FFC/FPC 25P			
CN504	1-764-177-11	PIN, CONNECTOR (SMD)(1.5MM) 7P			
* CN601	1-695-110-11	PIN, CONNECTOR (PC BOARD) 8P			
CN603	1-774-768-11	CONNECTOR, FFC/FPC 17P			
CN801	1-573-489-11	PIN, CONNECTOR (PC BOARD) 11P			
* CN1101	1-573-768-21	PIN, CONNECTOR (1.5MM) (SMD)5P			
		< DIODE >			
D301	8-719-050-38	DIODE M1MA152WK-T1			
D405	8-719-081-97	DIODE MMDL914T1			
D602	8-719-075-77	DIODE EC10DA40-TE12			
D613	8-719-081-97	DIODE MMDL914T1			
D614	8-719-992-02	DIODE RB705D6			
D701	8-719-050-38	DIODE M1MA152WK-T1			
D802	8-719-071-15	DIODE HZM6.8ZWA1TL			
D803	8-719-071-15	DIODE HZM6.8ZWA1TL			
D805	8-719-071-15	DIODE HZM6.8ZWA1TL			
D806	8-719-071-15	DIODE HZM6.8ZWA1TL			
D811	8-719-071-15	DIODE HZM6.8ZWA1TL			
D812	8-719-071-15	DIODE HZM6.8ZWA1TL			
D815	8-719-071-15	DIODE HZM6.8ZWA1TL			
D816	8-719-071-15	DIODE HZM6.8ZWA1TL			
D1101	8-719-075-77	DIODE EC10DA40-TE12			
D1102	8-719-071-15	DIODE HZM6.8ZWA1TL			
D1103	8-719-071-15	DIODE HZM6.8ZWA1TL			
D1104	8-719-071-15	DIODE HZM6.8ZWA1TL			
D1105	8-719-071-15	DIODE HZM6.8ZWA1TL			
		< FERRITE BEAD >			
FB601	1-414-813-11	FERRITE	0uH		
FB1101	1-414-228-11	FERRITE	0uH		

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Ref. No.	Part No.	Description	Remarks
		< IC >	
IC101	6-705-308-01	IC SI-3010KM-TL	
IC102	6-706-237-01	IC PQ1MX55M2SPQ	
IC103	6-705-338-01	IC TK11250CMCL-G	
IC104	6-705-308-01	IC SI-3010KM-TL	
IC201	6-703-503-01	IC AK5365VQ	
IC301	8-759-052-52	IC L78M05T-FA	
IC302	6-705-404-01	IC BA4558F-HTE2	
IC401	6-706-237-01	IC PQ1MX55M2SPQ	
IC404	8-749-925-00	IC TK11819MTL	
IC602	8-759-679-19	IC S-24C04BFJ-TB	
IC603	6-804-347-01	IC M306H2MC-511FPU0	
IC604	6-702-879-01	IC R3112N281A-TR	
IC607	8-759-242-70	IC TC7WU04F	
IC701	6-705-005-01	IC LA73031V-TLM-E	
IC801	8-759-667-17	IC L79M05TLL-SONY-TL-E	
IC802	6-704-839-01	IC LA73056-TLM-E	
IC1101	6-804-428-01	IC S3C80F9XKA-SO77	
		< JACK >	
J803	1-784-643-21	JACK BLOCK, PIN	
J804	1-784-643-21	JACK BLOCK, PIN	
J1102	1-818-503-11	JACK, SMALL TYPE	
		< JAMPER RESISTOR >	
JS401	1-216-295-91	SHORT CHIP 0	
JS402	1-216-295-91	SHORT CHIP 0	
JS409	1-216-295-91	SHORT CHIP 0	
JS410	1-216-295-91	SHORT CHIP 0	
JS411	1-216-295-91	SHORT CHIP 0	
		< COIL >	
L201	1-414-187-11	INDUCTOR 47uH	
L402	1-414-187-11	INDUCTOR 47uH	
L403	1-469-967-21	INDUCTOR 10uH	
L405	1-469-967-21	INDUCTOR 10uH	
L406	1-414-858-31	INDUCTOR 1MH	
L408	1-414-187-11	INDUCTOR 47uH	
L409	1-414-187-11	INDUCTOR 47uH	
L411	1-414-187-11	INDUCTOR 47uH	
L601	1-412-533-21	INDUCTOR 47uH	
L602	1-412-533-21	INDUCTOR 47uH	
L701	1-469-967-21	INDUCTOR 10uH	
L801	1-400-145-21	INDUCTOR 47uH	
L802	1-400-145-21	INDUCTOR 47uH	
L803	1-412-060-11	INDUCTOR 22uH	
		< TRANSISTOR >	
Q101	8-729-421-19	TRANSISTOR UN2213	
Q301	8-729-424-08	TRANSISTOR UN2111	
Q302	8-729-921-73	TRANSISTOR 2SD1781K-QR	
Q303	8-729-010-25	TRANSISTOR MSD601-RT1	
Q304	8-729-045-17	TRANSISTOR 2SB1561T100Q	
Q305	8-729-421-19	TRANSISTOR UN2213	
Q307	8-729-027-53	TRANSISTOR DTC124TKA-T146	
Q309	8-729-046-97	TRANSISTOR 2SD1938(F)-T(TX).SO	
Q310	8-729-046-97	TRANSISTOR 2SD1938(F)-T(TX).SO	
Q311	8-729-010-05	TRANSISTOR MSB709-RT1	

Ref. No.	Part No.	Description	Remarks
Q313	8-729-010-25	TRANSISTOR MSD601-RT1	
Q402	8-729-010-25	TRANSISTOR MSD601-RT1	
Q403	8-729-421-19	TRANSISTOR UN2213	
Q406	8-729-010-25	TRANSISTOR MSD601-RT1	
Q407	8-729-010-25	TRANSISTOR MSD601-RT1	
Q408	8-729-010-05	TRANSISTOR MSB709-RT1	
Q410	8-729-421-22	TRANSISTOR UN2211	
Q412	8-729-010-05	TRANSISTOR MSB709-RT1	
Q413	8-729-010-25	TRANSISTOR MSD601-RT1	
Q414	8-729-421-22	TRANSISTOR UN2211	
Q415	8-729-045-17	TRANSISTOR 2SB1561T100Q	
Q601	8-729-010-05	TRANSISTOR MSB709-RT1	
Q602	8-729-010-25	TRANSISTOR MSD601-RT1	
Q603	8-729-421-22	TRANSISTOR UN2211	
Q604	8-729-424-08	TRANSISTOR UN2111	
Q607	8-729-921-73	TRANSISTOR 2SD1781K-QR	
Q616	8-729-010-05	TRANSISTOR MSB709-RT1	
Q617	8-729-421-19	TRANSISTOR UN2213-TX	
Q701	8-729-024-88	TRANSISTOR MUN2212T1	
Q702	8-729-045-17	TRANSISTOR 2SB1561T100Q	
Q703	8-729-010-05	TRANSISTOR MSB709-RT1	
Q704	8-729-010-05	TRANSISTOR MSB709-RT1	
Q705	8-729-010-05	TRANSISTOR MSB709-RT1	
Q706	8-729-010-05	TRANSISTOR MSB709-RT1	
Q801	8-729-424-08	TRANSISTOR UN2111	
Q802	8-729-921-73	TRANSISTOR 2SD1781K-QR	
Q809	8-729-010-25	TRANSISTOR MSD601-RT1	
Q810	8-729-010-25	TRANSISTOR MSD601-RT1	
Q811	8-729-010-25	TRANSISTOR MSD601-RT1	
Q812	8-729-010-25	TRANSISTOR MSD601-RT1	
Q813	8-729-010-25	TRANSISTOR MSD601-RT1	
Q814	8-729-010-25	TRANSISTOR MSD601-RT1	
Q815	8-729-421-19	TRANSISTOR UN2213	
Q816	8-729-424-08	TRANSISTOR UN2111	
Q1104	8-729-045-17	TRANSISTOR 2SB1561T100Q	
		< RESISTOR >	
R105	1-216-296-11	SHORT CHIP 0	
R106	1-216-296-11	SHORT CHIP 0	
R107	1-216-296-11	SHORT CHIP 0	
R108	1-216-296-11	SHORT CHIP 0	
R109	1-218-895-11	METAL CHIP 100K 0.5% 1/10W	
R110	1-216-833-11	METAL CHIP 10K 5% 1/10W	
R111	1-218-865-11	METAL CHIP 5.6K 0.5% 1/10W	
R118	1-216-833-11	METAL CHIP 10K 5% 1/10W	
R122	1-216-822-11	METAL CHIP 1.2K 5% 1/10W	
R123	1-218-879-11	METAL CHIP 22K 0.5% 1/10W	
R124	1-218-871-11	METAL CHIP 10K 0.5% 1/10W	
R137	1-218-907-11	METAL CHIP 330K 0.5% 1/10W	
R138	1-218-897-11	METAL CHIP 120K 0.5% 1/10W	
R139	1-218-887-11	METAL CHIP 47K 0.5% 1/10W	
R214	1-218-887-11	METAL CHIP 47K 0.5% 1/10W	
R215	1-218-887-11	METAL CHIP 47K 0.5% 1/10W	
R216	1-218-887-11	METAL CHIP 47K 0.5% 1/10W	
R217	1-218-887-11	METAL CHIP 47K 0.5% 1/10W	
R218	1-218-874-11	METAL CHIP 13K 0.5% 1/10W	
R220	1-218-887-11	METAL CHIP 47K 0.5% 1/10W	

Ref. No.	Part No.	Description			Remarks
R221	1-218-874-11	METAL CHIP	13K	0.5%	1/10W
R222	1-218-887-11	METAL CHIP	47K	0.5%	1/10W
R223	1-218-887-11	METAL CHIP	47K	0.5%	1/10W
R224	1-218-887-11	METAL CHIP	47K	0.5%	1/10W
R228	1-216-837-11	METAL CHIP	22K	5%	1/10W
R229	1-216-837-11	METAL CHIP	22K	5%	1/10W
R230	1-216-837-11	METAL CHIP	22K	5%	1/10W
R234	1-216-809-11	METAL CHIP	100	5%	1/10W
R235	1-216-818-11	METAL CHIP	560	5%	1/10W
R236	1-216-801-11	METAL CHIP	22	5%	1/10W
R237	1-216-797-11	METAL CHIP	10	5%	1/10W
R238	1-216-801-11	METAL CHIP	22	5%	1/10W
R242	1-216-836-11	METAL CHIP	18K	5%	1/10W
R243	1-216-836-11	METAL CHIP	18K	5%	1/10W
R244	1-216-836-11	METAL CHIP	18K	5%	1/10W
R302	1-216-821-11	METAL CHIP	1K	5%	1/10W
R303	1-216-817-11	METAL CHIP	470	5%	1/10W
R304	1-216-849-11	METAL CHIP	220K	5%	1/10W
R305	1-216-833-11	METAL CHIP	10K	5%	1/10W
R306	1-216-833-11	METAL CHIP	10K	5%	1/10W
R307	1-216-833-11	METAL CHIP	10K	5%	1/10W
R308	1-216-845-11	METAL CHIP	100K	5%	1/10W
R309	1-216-830-11	METAL CHIP	5.6K	5%	1/10W
R310	1-218-863-11	METAL CHIP	4.7K	0.5%	1/10W
R311	1-218-863-11	METAL CHIP	4.7K	0.5%	1/10W
R312	1-218-863-11	METAL CHIP	4.7K	0.5%	1/10W
R313	1-218-863-11	METAL CHIP	4.7K	0.5%	1/10W
R314	1-218-865-11	METAL CHIP	5.6K	0.5%	1/10W
R315	1-218-865-11	METAL CHIP	5.6K	0.5%	1/10W
R316	1-216-825-11	METAL CHIP	2.2K	5%	1/10W
R317	1-216-825-11	METAL CHIP	2.2K	5%	1/10W
R318	1-216-825-11	METAL CHIP	2.2K	5%	1/10W
R320	1-216-825-11	METAL CHIP	2.2K	5%	1/10W
R321	1-218-865-11	METAL CHIP	5.6K	0.5%	1/10W
R323	1-218-865-11	METAL CHIP	5.6K	0.5%	1/10W
R324	1-216-864-11	SHORT CHIP	0		
R326	1-216-817-11	METAL CHIP	470	5%	1/10W
R327	1-216-817-11	METAL CHIP	470	5%	1/10W
R330	1-216-841-11	METAL CHIP	47K	5%	1/10W
R331	1-216-841-11	METAL CHIP	47K	5%	1/10W
R332	1-216-833-11	METAL CHIP	10K	5%	1/10W
R334	1-216-833-11	METAL CHIP	10K	5%	1/10W
R335	1-216-841-11	METAL CHIP	47K	5%	1/10W
R338	1-216-833-11	METAL CHIP	10K	5%	1/10W
R340	1-216-829-11	METAL CHIP	4.7K	5%	1/10W
R343	1-216-845-11	METAL CHIP	100K	5%	1/10W
R345	1-216-821-11	METAL CHIP	1K	5%	1/10W
R346	1-216-821-11	METAL CHIP	1K	5%	1/10W
R347	1-216-821-11	METAL CHIP	1K	5%	1/10W
R348	1-216-813-11	METAL CHIP	220	5%	1/10W
R350	1-216-807-11	METAL CHIP	68	5%	1/10W
R352	1-216-817-11	METAL CHIP	470	5%	1/10W
R353	1-216-817-11	METAL CHIP	470	5%	1/10W
R354	1-216-817-11	METAL CHIP	470	5%	1/10W
R355	1-216-817-11	METAL CHIP	470	5%	1/10W
R362	1-216-829-11	METAL CHIP	4.7K	5%	1/10W
R405	1-216-809-11	METAL CHIP	100	5%	1/10W
R407	1-216-049-11	RES-CHIP	1K	5%	1/10W
R409	1-216-845-11	METAL CHIP	100K	5%	1/10W
R410	1-216-838-11	METAL CHIP	27K	5%	1/10W
R411	1-218-895-11	METAL CHIP	100K	0.5%	1/10W
R412	1-218-903-11	METAL CHIP	220K	0.5%	1/10W
R413	1-218-895-11	METAL CHIP	100K	0.5%	1/10W
R414	1-216-864-11	SHORT CHIP	0		
R418	1-216-823-11	METAL CHIP	1.5K	5%	1/10W
R419	1-216-828-11	METAL CHIP	3.9K	5%	1/10W
R420	1-216-821-11	METAL CHIP	1K	5%	1/10W
R421	1-216-826-11	METAL CHIP	2.7K	5%	1/10W
R423	1-216-857-11	METAL CHIP	1M	5%	1/10W
R424	1-216-829-11	METAL CHIP	4.7K	5%	1/10W
R426	1-216-809-11	METAL CHIP	100	5%	1/10W
R427	1-216-823-11	METAL CHIP	1.5K	5%	1/10W
R428	1-216-821-11	METAL CHIP	1K	5%	1/10W
R433	1-216-821-11	METAL CHIP	1K	5%	1/10W
R434	1-216-809-11	METAL CHIP	100	5%	1/10W
R436	1-216-833-11	METAL CHIP	10K	5%	1/10W
R440	1-216-821-11	METAL CHIP	1K	5%	1/10W
R441	1-216-821-11	METAL CHIP	1K	5%	1/10W
R453	1-216-845-11	METAL CHIP	100K	5%	1/10W
R457	1-216-025-11	RES-CHIP	100	5%	1/10W
R468	1-216-823-11	METAL CHIP	1.5K	5%	1/10W
R469	1-216-817-11	METAL CHIP	470	5%	1/10W
R479	1-216-837-11	METAL CHIP	22K	5%	1/10W
R480	1-216-864-11	SHORT CHIP	0		
R481	1-216-837-11	METAL CHIP	22K	5%	1/10W
R482	1-216-864-11	SHORT CHIP	0		
R484	1-216-809-11	METAL CHIP	100	5%	1/10W
R486	1-216-829-11	METAL CHIP	4.7K	5%	1/10W
R487	1-216-809-11	METAL CHIP	100	5%	1/10W
R488	1-216-809-11	METAL CHIP	100	5%	1/10W
R489	1-216-829-11	METAL CHIP	4.7K	5%	1/10W
R490	1-216-809-11	METAL CHIP	100	5%	1/10W
R491	1-216-821-11	METAL CHIP	1K	5%	1/10W
R492	1-216-821-11	METAL CHIP	1K	5%	1/10W
R493	1-216-821-11	METAL CHIP	1K	5%	1/10W
R505	1-216-833-11	METAL CHIP	10K	5%	1/10W
R508	1-216-833-11	METAL CHIP	10K	5%	1/10W
R601	1-216-833-11	METAL CHIP	10K	5%	1/10W
R602	1-216-833-11	METAL CHIP	10K	5%	1/10W
R604	1-216-809-11	METAL CHIP	100	5%	1/10W
R605	1-216-809-11	METAL CHIP	100	5%	1/10W
R607	1-216-809-11	METAL CHIP	100	5%	1/10W
R610	1-216-789-11	METAL CHIP	2.2	5%	1/10W
R611	1-216-840-11	METAL CHIP	39K	5%	1/10W
R612	1-216-837-11	METAL CHIP	22K	5%	1/10W
R613	1-216-817-11	METAL CHIP	470	5%	1/10W
R615	1-216-833-11	METAL CHIP	10K	5%	1/10W
R616	1-216-864-11	SHORT CHIP	0		
R618	1-216-864-11	SHORT CHIP	0		
R619	1-216-833-11	METAL CHIP	10K	5%	1/10W
R620	1-216-833-11	METAL CHIP	10K	5%	1/10W
R621	1-216-864-11	SHORT CHIP	0		
R622	1-216-829-11	METAL CHIP	4.7K	5%	1/10W
R623	1-216-864-11	SHORT CHIP	0		
R624	1-216-829-11	METAL CHIP	4.7K	5%	1/10W
R625	1-216-864-11	SHORT CHIP	0		
R626	1-216-833-11	METAL CHIP	10K	5%	1/10W
R628	1-216-833-11	METAL CHIP	10K	5%	1/10W
R631	1-216-833-11	METAL CHIP	10K	5%	1/10W
R632	1-216-864-11	SHORT CHIP	0		

Ref. No.	Part No.	Description			Remarks
R633	1-216-864-11	SHORT CHIP	0		
R634	1-216-059-00	RES-CHIP	2.7K	5%	1/10W
R635	1-216-059-00	RES-CHIP	2.7K	5%	1/10W
R637	1-216-833-11	METAL CHIP	10K	5%	1/10W
R639	1-216-809-11	METAL CHIP	100	5%	1/10W
R640	1-216-809-11	METAL CHIP	100	5%	1/10W
R642	1-216-833-11	METAL CHIP	10K	5%	1/10W
R653	1-216-809-11	METAL CHIP	100	5%	1/10W
R654	1-216-864-11	SHORT CHIP	0		
R657	1-216-833-11	METAL CHIP	10K	5%	1/10W
R658	1-216-833-11	METAL CHIP	10K	5%	1/10W
R659	1-216-833-11	METAL CHIP	10K	5%	1/10W
R661	1-216-833-11	METAL CHIP	10K	5%	1/10W
R662	1-216-817-11	METAL CHIP	470	5%	1/10W
R667	1-216-833-11	METAL CHIP	10K	5%	1/10W
R668	1-216-864-11	SHORT CHIP	0		
R669	1-216-864-11	SHORT CHIP	0		
R671	1-216-857-11	METAL CHIP	1M	5%	1/10W
R673	1-218-289-11	METAL CHIP	510	5%	1/10W
R674	1-216-841-11	METAL CHIP	47K	5%	1/10W
R675	1-216-864-11	SHORT CHIP	0		
R676	1-216-825-11	METAL CHIP	2.2K	5%	1/10W
R677	1-216-853-11	METAL CHIP	470K	5%	1/10W
R678	1-216-833-11	METAL CHIP	10K	5%	1/10W
R679	1-216-817-11	METAL CHIP	470	5%	1/10W
R680	1-216-809-11	METAL CHIP	100	5%	1/10W
R685	1-216-817-11	METAL CHIP	470	5%	1/10W
R686	1-216-809-11	METAL CHIP	100	5%	1/10W
R687	1-216-864-11	SHORT CHIP	0		
R688	1-216-809-11	METAL CHIP	100	5%	1/10W
R689	1-216-809-11	METAL CHIP	100	5%	1/10W
R691	1-216-833-11	METAL CHIP	10K	5%	1/10W
R692	1-216-809-11	METAL CHIP	100	5%	1/10W
R695	1-216-833-11	METAL CHIP	10K	5%	1/10W
R696	1-216-809-11	METAL CHIP	100	5%	1/10W
R698	1-216-809-11	METAL CHIP	100	5%	1/10W
R699	1-216-809-11	METAL CHIP	100	5%	1/10W
R703	1-216-829-11	METAL CHIP	4.7K	5%	1/10W
R705	1-216-864-11	SHORT CHIP	0		
R707	1-216-833-11	METAL CHIP	10K	5%	1/10W
R709	1-216-833-11	METAL CHIP	10K	5%	1/10W
R710	1-216-821-11	METAL CHIP	1K	5%	1/10W
R711	1-216-833-11	METAL CHIP	10K	5%	1/10W
R712	1-216-833-11	METAL CHIP	10K	5%	1/10W
R713	1-216-864-11	SHORT CHIP	0		
R716	1-216-821-11	METAL CHIP	1K	5%	1/10W
R717	1-216-821-11	METAL CHIP	1K	5%	1/10W
R720	1-216-821-11	METAL CHIP	1K	5%	1/10W
R721	1-216-821-11	METAL CHIP	1K	5%	1/10W
R724	1-216-821-11	METAL CHIP	1K	5%	1/10W
R725	1-216-821-11	METAL CHIP	1K	5%	1/10W
R743	1-216-833-11	METAL CHIP	10K	5%	1/10W
R753	1-216-864-11	SHORT CHIP	0		
R754	1-216-821-11	METAL CHIP	1K	5%	1/10W
R755	1-216-821-11	METAL CHIP	1K	5%	1/10W
R756	1-216-821-11	METAL CHIP	1K	5%	1/10W
R757	1-216-821-11	METAL CHIP	1K	5%	1/10W
R758	1-216-821-11	METAL CHIP	1K	5%	1/10W
R759	1-216-821-11	METAL CHIP	1K	5%	1/10W
R801	1-216-864-11	SHORT CHIP	0		
R802	1-216-833-11	METAL CHIP	10K	5%	1/10W
R803	1-216-864-11	SHORT CHIP	0		
R805	1-216-864-11	SHORT CHIP	0		
R809	1-216-825-11	METAL CHIP	2.2K	5%	1/10W
R816	1-216-825-11	METAL CHIP	2.2K	5%	1/10W
R817	1-216-825-11	METAL CHIP	2.2K	5%	1/10W
R818	1-216-825-11	METAL CHIP	2.2K	5%	1/10W
R819	1-216-825-11	METAL CHIP	2.2K	5%	1/10W
R820	1-216-825-11	METAL CHIP	2.2K	5%	1/10W
R821	1-216-825-11	METAL CHIP	2.2K	5%	1/10W
R822	1-216-801-11	METAL CHIP	22	5%	1/10W
R823	1-216-801-11	METAL CHIP	22	5%	1/10W
R824	1-216-801-11	METAL CHIP	22	5%	1/10W
R825	1-216-801-11	METAL CHIP	22	5%	1/10W
R826	1-216-801-11	METAL CHIP	22	5%	1/10W
R827	1-216-801-11	METAL CHIP	22	5%	1/10W
R829	1-216-827-11	METAL CHIP	3.3K	5%	1/10W
R840	1-216-833-11	METAL CHIP	10K	5%	1/10W
R841	1-216-833-11	METAL CHIP	10K	5%	1/10W
R842	1-216-807-11	METAL CHIP	68	5%	1/10W
R843	1-216-807-11	METAL CHIP	68	5%	1/10W
R844	1-216-807-11	METAL CHIP	68	5%	1/10W
R845	1-216-807-11	METAL CHIP	68	5%	1/10W
R852	1-218-285-11	METAL CHIP	75	5%	1/10W
R853	1-216-807-11	METAL CHIP	68	5%	1/10W
R854	1-216-807-11	METAL CHIP	68	5%	1/10W
R855	1-218-285-11	METAL CHIP	75	5%	1/10W
R856	1-216-807-11	METAL CHIP	68	5%	1/10W
R857	1-216-807-11	METAL CHIP	68	5%	1/10W
R858	1-216-807-11	METAL CHIP	68	5%	1/10W
R859	1-218-285-11	METAL CHIP	75	5%	1/10W
R860	1-218-285-11	METAL CHIP	75	5%	1/10W
R861	1-218-285-11	METAL CHIP	75	5%	1/10W
R862	1-218-285-11	METAL CHIP	75	5%	1/10W
R873	1-218-285-11	METAL CHIP	75	5%	1/10W
R874	1-218-285-11	METAL CHIP	75	5%	1/10W
R875	1-218-285-11	METAL CHIP	75	5%	1/10W
R883	1-216-864-11	SHORT CHIP	0		
R884	1-216-864-11	SHORT CHIP	0		
R885	1-216-864-11	SHORT CHIP	0		
R886	1-216-864-11	SHORT CHIP	0		
R887	1-216-864-11	SHORT CHIP	0		
R1102	1-216-821-11	METAL CHIP	1K	5%	1/10W
R1103	1-216-821-11	METAL CHIP	1K	5%	1/10W
R1106	1-216-825-11	METAL CHIP	2.2K	5%	1/10W
R1107	1-216-037-00	RES-CHIP	330	5%	1/10W
R1108	1-216-864-11	SHORT CHIP	0		
R1110	1-216-825-11	METAL CHIP	2.2K	5%	1/10W
R1111	1-216-833-11	METAL CHIP	10K	5%	1/10W
R1113	1-216-864-11	SHORT CHIP	0		
R1115	1-216-864-11	SHORT CHIP	0		
R1116	1-216-845-11	METAL CHIP	100K	5%	1/10W
R1117	1-216-833-11	METAL CHIP	10K	5%	1/10W
R1119	1-216-864-11	SHORT CHIP	0		
R1120	1-216-821-11	METAL CHIP	1K	5%	1/10W
R1121	1-216-821-11	METAL CHIP	1K	5%	1/10W
R1122	1-216-813-11	METAL CHIP	220	5%	1/10W
R1123	1-216-813-11	METAL CHIP	220	5%	1/10W
R1125	1-216-833-11	METAL CHIP	10K	5%	1/10W
R1126	1-216-833-11	METAL CHIP	10K	5%	1/10W

Ref. No.	Part No.	Description			Remarks
R1127	1-216-833-11	METAL CHIP	10K	5%	1/10W
R1128	1-216-833-11	METAL CHIP	10K	5%	1/10W
R1129	1-216-833-11	METAL CHIP	10K	5%	1/10W
R1130	1-216-833-11	METAL CHIP	10K	5%	1/10W
R1131	1-216-833-11	METAL CHIP	10K	5%	1/10W
R1132	1-216-037-00	RES-CHIP	330	5%	1/10W
R1601	1-216-809-11	METAL CHIP	100	5%	1/10W
R1602	1-216-809-11	METAL CHIP	100	5%	1/10W
R1605	1-216-809-11	METAL CHIP	100	5%	1/10W
R1606	1-216-809-11	METAL CHIP	100	5%	1/10W
R1607	1-216-864-11	SHORT CHIP	0		
R1608	1-216-809-11	METAL CHIP	100	5%	1/10W
R1611	1-216-864-11	SHORT CHIP	0		
R1612	1-216-864-11	SHORT CHIP	0		
R1614	1-216-833-11	METAL CHIP	10K	5%	1/10W
R1617	1-216-833-11	METAL CHIP	10K	5%	1/10W
R1620	1-216-809-11	METAL CHIP	100	5%	1/10W
R1626	1-216-864-11	SHORT CHIP	0		
R1628	1-216-864-11	SHORT CHIP	0		
R1630	1-216-817-11	METAL CHIP	470	5%	1/10W
R1631	1-216-829-11	METAL CHIP	4.7K	5%	1/10W
R1632	1-216-829-11	METAL CHIP	4.7K	5%	1/10W
R1633	1-216-833-11	METAL CHIP	10K	5%	1/10W
R1635	1-216-833-11	METAL CHIP	10K	5%	1/10W
R1636	1-216-833-11	METAL CHIP	10K	5%	1/10W
R1640	1-216-833-11	METAL CHIP	10K	5%	1/10W
R1641	1-216-825-11	METAL CHIP	2.2K	5%	1/10W
R1642	1-216-841-11	METAL CHIP	47K	5%	1/10W
R1644	1-216-809-11	METAL CHIP	100	5%	1/10W
R1645	1-216-833-11	METAL CHIP	10K	5%	1/10W
R1646	1-216-833-11	METAL CHIP	10K	5%	1/10W
R1647	1-216-849-11	METAL CHIP	220K	5%	1/10W
R1648	1-216-809-11	METAL CHIP	100	5%	1/10W
R1649	1-216-809-11	METAL CHIP	100	5%	1/10W
R1650	1-216-809-11	METAL CHIP	100	5%	1/10W
R1651	1-216-864-11	SHORT CHIP	0		
R1652	1-216-809-11	METAL CHIP	100	5%	1/10W
R1653	1-216-809-11	METAL CHIP	100	5%	1/10W
R1654	1-216-864-11	SHORT CHIP	0		
R1655	1-216-833-11	METAL CHIP	10K	5%	1/10W
R1656	1-216-864-11	SHORT CHIP	0		
R1657	1-216-864-11	SHORT CHIP	0		
R1658	1-216-833-11	METAL CHIP	10K	5%	1/10W
R1659	1-216-864-11	SHORT CHIP	0		
R1660	1-216-833-11	METAL CHIP	10K	5%	1/10W
R1661	1-216-833-11	METAL CHIP	10K	5%	1/10W
R1662	1-216-833-11	METAL CHIP	10K	5%	1/10W
R1663	1-216-833-11	METAL CHIP	10K	5%	1/10W
R1664	1-216-833-11	METAL CHIP	10K	5%	1/10W
R1665	1-216-833-11	METAL CHIP	10K	5%	1/10W
R1666	1-216-833-11	METAL CHIP	10K	5%	1/10W
R1667	1-216-833-11	METAL CHIP	10K	5%	1/10W
R1668	1-216-809-11	METAL CHIP	100	5%	1/10W
R1669	1-216-809-11	METAL CHIP	100	5%	1/10W
R1670	1-216-864-11	SHORT CHIP	0		
R1671	1-216-864-11	SHORT CHIP	0		
R1672	1-216-825-11	METAL CHIP	2.2K	5%	1/10W
R1673	1-216-825-11	METAL CHIP	2.2K	5%	1/10W
R1674	1-216-833-11	METAL CHIP	10K	5%	1/10W
R1676	1-216-833-11	METAL CHIP	10K	5%	1/10W
R1677	1-216-864-11	SHORT CHIP	0		
R1678	1-216-864-11	SHORT CHIP	0		
R1682	1-216-833-11	METAL CHIP	10K	5%	1/10W
R1683	1-218-867-11	METAL CHIP	6.8K	0.5%	1/10W
R1684	1-218-855-11	METAL CHIP	2.2K	0.5%	1/10W
R1685	1-216-864-11	SHORT CHIP	0		
R1686	1-216-864-11	SHORT CHIP	0		
R1687	1-218-859-11	METAL CHIP	3.3K	0.5%	1/10W
R1688	1-218-871-11	METAL CHIP	10K	0.5%	1/10W
R1689	1-216-825-11	METAL CHIP	2.2K	5%	1/10W
R1693	1-216-827-11	METAL CHIP	3.3K	5%	1/10W
R1695	1-216-864-11	SHORT CHIP	0		
R1696	1-216-864-11	SHORT CHIP	0		
R1698	1-218-875-11	METAL CHIP	15K	0.5%	1/10W
R1699	1-216-832-11	METAL CHIP	8.2K	5%	1/10W
R1700	1-216-825-11	METAL CHIP	2.2K	5%	1/10W
R1701	1-216-833-11	METAL CHIP	10K	5%	1/10W
R1702	1-216-833-11	METAL CHIP	10K	5%	1/10W
R1703	1-216-833-11	METAL CHIP	10K	5%	1/10W
R1704	1-216-833-11	METAL CHIP	10K	5%	1/10W
R1705	1-216-864-11	SHORT CHIP	0		
R1706	1-216-864-11	SHORT CHIP	0		
R1707	1-216-833-11	METAL CHIP	10K	5%	1/10W
R1708	1-216-833-11	METAL CHIP	10K	5%	1/10W
R1709	1-216-833-11	METAL CHIP	10K	5%	1/10W
R1711	1-216-845-11	METAL CHIP	100K	5%	1/10W
		< TUNER >			
TU401	8-598-612-10	TUNER, FSS BTF-DA401			
		< VIBRATOR >			
X601	1-795-243-21	VIBRATOR, CRYSTAL (SMD)			
X602	1-781-913-11	VIBRATOR, CRYSTAL			
X603	1-579-041-11	VIBRATOR, CRYSTAL			
X1101	1-781-472-21	VIBRATOR, CERAMIC			
*	A-1077-053-A	FL-140 (UH) BOARD COMPL			
		**********			
					(REF.NO.;40,000 SERIES)
		< CAPACITOR >			
C101	1-124-589-11	ELECT	47uF	20%	16V
C102	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C105	1-115-339-11	CERAMIC CHIP	0.1uF	10%	50V
C106	1-162-922-11	CERAMIC CHIP	39PF	5%	50V
C109	1-162-927-11	CERAMIC CHIP	100PF	5%	50V
C110	1-162-927-11	CERAMIC CHIP	100PF	5%	50V
C112	1-125-972-91	ELECT	100uF	20%	16V
C113	1-106-363-00	MYLAR	0.0068uF	5%	100V
C114	1-115-339-11	CERAMIC CHIP	0.1uF	10%	50V
C115	1-128-131-11	ELECT	22uF	20%	50V
C116	1-115-339-11	CERAMIC CHIP	0.1uF	10%	50V
C118	1-115-339-11	CERAMIC CHIP	0.1uF	10%	50V
		< CONNECTOR >			
CN102	1-794-479-11	CONNECTOR, FPC/FFC 9P			
CN103	1-785-828-21	CONNECTOR, SQUARE TYPE 4P			
CN104	1-564-722-11	PIN, CONNECTOR (SMALL TYPE) 6P			
CN105	1-573-489-11	PIN, CONNECTOR (PC BOARD) 11P			

Ref. No.	Part No.	Description	Remarks
		< DIODE >	
D101	8-719-988-61	DIODE 1SS355TE-17	
D102	8-719-067-40	DIODE STZ6.8N-T146	
D104	8-719-067-40	DIODE STZ6.8N-T146	
D105	8-719-067-40	DIODE STZ6.8N-T146	
D106	8-719-067-40	DIODE STZ6.8N-T146	
D107	8-719-067-40	DIODE STZ6.8N-T146	
D108	8-719-067-40	DIODE STZ6.8N-T146	
D109	8-719-067-40	DIODE STZ6.8N-T146	
D110	8-719-988-61	DIODE 1SS355TE-17	
D111	8-719-988-61	DIODE 1SS355TE-17	
D112	8-719-988-61	DIODE 1SS355TE-17	
D113	8-719-083-70	DIODE UDZSTE-1727B	
D114	8-719-422-62	DIODE MA8062-L-TX	
		< TERMINAL >	
ET101	1-537-738-21	TERMINAL, EARTH	
		< FERRITE BEAD >	
FB101	1-414-233-22	FERRITE 0uH	
FB102	1-414-233-22	FERRITE 0uH	
FB103	1-414-233-22	FERRITE 0uH	
		< IC >	
IC101	6-705-405-01	IC ML9208-02MBZ03B	
		< JUMPER RESISTOR >	
J101	1-694-980-21	TERMINAL BOARD (S TERMINAL+3P)	
JR101	1-216-296-11	SHORT CHIP 0	
JR102	1-216-296-11	SHORT CHIP 0	
JR103	1-216-296-11	SHORT CHIP 0	
JR104	1-216-296-11	SHORT CHIP 0	
JR105	1-216-296-11	SHORT CHIP 0	
JR106	1-216-296-11	SHORT CHIP 0	
JR107	1-216-296-11	SHORT CHIP 0	
JR108	1-216-295-91	SHORT CHIP 0	
JR109	1-216-295-91	SHORT CHIP 0	
JR110	1-216-296-11	SHORT CHIP 0	
JR111	1-216-295-91	SHORT CHIP 0	
JR112	1-216-296-11	SHORT CHIP 0	
JR113	1-216-296-11	SHORT CHIP 0	
JR114	1-216-296-11	SHORT CHIP 0	
JR115	1-216-296-11	SHORT CHIP 0	
JR116	1-216-296-11	SHORT CHIP 0	
JR117	1-216-295-91	SHORT CHIP 0	
JR118	1-216-296-11	SHORT CHIP 0	
JR119	1-216-296-11	SHORT CHIP 0	
JR120	1-216-295-91	SHORT CHIP 0	
JR121	1-216-296-11	SHORT CHIP 0	
JR122	1-216-295-91	SHORT CHIP 0	
JR123	1-216-295-91	SHORT CHIP 0	
JR124	1-216-295-91	SHORT CHIP 0	
JR125	1-216-296-11	SHORT CHIP 0	
		< COIL >	
L101	1-412-533-21	INDUCTOR 47uH	

Ref. No.	Part No.	Description			Remarks
		< FLUORESCENT TUBE >			
ND101	1-518-948-11	INDICATOR TUBE, FLUORESCENT			
		< TRANSISTOR >			
Q101	8-729-056-46	TRANSISTOR 2SC5053T100Q			
Q102	8-729-056-46	TRANSISTOR 2SC5053T100Q			
Q103	8-729-904-87	TRANSISTOR 2SB1197K-R			
		< RESISTOR >			
R102	1-216-825-11	METAL CHIP	2.2K	5% 1/10W	
R104	1-216-809-11	METAL CHIP	100	5% 1/10W	
R105	1-216-809-11	METAL CHIP	100	5% 1/10W	
R106	1-216-809-11	METAL CHIP	100	5% 1/10W	
R107	1-216-809-11	METAL CHIP	100	5% 1/10W	
R108	1-216-827-11	METAL CHIP	3.3K	5% 1/10W	
R109	1-216-864-11	SHORT CHIP	0		
R110	1-216-864-11	SHORT CHIP	0		
R111	1-216-864-11	SHORT CHIP	0		
R112	1-218-285-11	METAL CHIP	75	5% 1/10W	
R113	1-218-285-11	METAL CHIP	75	5% 1/10W	
R114	1-218-285-11	METAL CHIP	75	5% 1/10W	
R115	1-216-849-11	METAL CHIP	220K	5% 1/10W	
R116	1-216-849-11	METAL CHIP	220K	5% 1/10W	
R118	1-216-833-11	METAL CHIP	10K	5% 1/10W	
R120	1-216-838-11	METAL CHIP	27K	5% 1/10W	
		< SWITCH >			
S101	1-771-798-21	SWITCH, TACT			
		< TRANSFORMER >			
T101	1-443-137-11	TRANSFORMER, DC-DC CONVERTER			
*	A-1077-055-A	FR-215 (UH) COMPL			
		********** (REF.NO.;40,000 SERIES)			
		< CAPACITOR >			
C062	1-107-726-91	CERAMIC CHIP	0.01uF	10% 16V	
C063	1-107-726-91	CERAMIC CHIP	0.01uF	10% 16V	
C064	1-107-826-11	CERAMIC CHIP	0.1uF	10% 16V	
		< CONNECTOR >			
CN001	1-793-599-11	CONNECTOR, FFC/FPC (ZIF) 17P			
CN002	1-794-473-11	CONNECTOR, FPC/FFC 9P			
		< DIODE >			
D002	8-719-077-79	DIODE SLR-332VRT32			
D004	6-500-176-01	DIODE EB3804X-TP-J555K			
D005	8-719-084-27	DIODE SLI-343YCT32WST			
		< SWITCH >			
EN030	1-786-502-21	SWITCH, TACTILE			
		< IC >			
IC061	6-600-350-01	IC GP1UM27SXK1F			
IC062	8-752-842-96	IC CXP2008M			

Ref. No.	Part No.	Description		Remarks
		< JUMPER RESISTOR >		
JR001	1-216-295-91	SHORT CHIP	0	
JR002	1-216-296-11	SHORT CHIP	0	
JR003	1-216-296-11	SHORT CHIP	0	
JR004	1-216-296-11	SHORT CHIP	0	
JR005	1-216-296-11	SHORT CHIP	0	
JR006	1-216-296-11	SHORT CHIP	0	
JR007	1-216-295-91	SHORT CHIP	0	
JR008	1-216-295-91	SHORT CHIP	0	
JR009	1-216-296-11	SHORT CHIP	0	
JR010	1-216-296-11	SHORT CHIP	0	
JR011	1-216-295-91	SHORT CHIP	0	
JR012	1-216-295-91	SHORT CHIP	0	
JR013	1-216-296-11	SHORT CHIP	0	
JR014	1-216-295-91	SHORT CHIP	0	
JR015	1-216-296-11	SHORT CHIP	0	
JR016	1-216-296-11	SHORT CHIP	0	
JR017	1-216-296-11	SHORT CHIP	0	
JR018	1-216-296-11	SHORT CHIP	0	
JR019	1-216-295-91	SHORT CHIP	0	
JR020	1-216-295-91	SHORT CHIP	0	
JR021	1-216-295-91	SHORT CHIP	0	
JR022	1-216-295-91	SHORT CHIP	0	
JR023	1-216-296-11	SHORT CHIP	0	
JR024	1-216-295-91	SHORT CHIP	0	
JR025	1-216-295-91	SHORT CHIP	0	
JR026	1-216-296-11	SHORT CHIP	0	
JR027	1-216-296-11	SHORT CHIP	0	
JR028	1-216-296-11	SHORT CHIP	0	
JR029	1-216-296-11	SHORT CHIP	0	
JR030	1-216-296-11	SHORT CHIP	0	
JR031	1-216-296-11	SHORT CHIP	0	
JR032	1-216-296-11	SHORT CHIP	0	
JR033	1-216-296-11	SHORT CHIP	0	
JR034	1-216-296-11	SHORT CHIP	0	
JR035	1-216-295-91	SHORT CHIP	0	
JR036	1-216-295-91	SHORT CHIP	0	
JR037	1-216-295-91	SHORT CHIP	0	
JR038	1-216-295-91	SHORT CHIP	0	
JR039	1-216-296-11	SHORT CHIP	0	
JR040	1-216-296-11	SHORT CHIP	0	
JR041	1-216-295-91	SHORT CHIP	0	
JR042	1-216-295-91	SHORT CHIP	0	
JR043	1-216-295-91	SHORT CHIP	0	
JR044	1-216-295-91	SHORT CHIP	0	
JR045	1-216-296-11	SHORT CHIP	0	
JR046	1-216-296-11	SHORT CHIP	0	
JR047	1-216-296-11	SHORT CHIP	0	
JR048	1-216-296-11	SHORT CHIP	0	
JR049	1-216-296-11	SHORT CHIP	0	
JR050	1-216-295-91	SHORT CHIP	0	
JR051	1-216-296-11	SHORT CHIP	0	
JR052	1-216-296-11	SHORT CHIP	0	
JR053	1-216-296-11	SHORT CHIP	0	
JR054	1-216-296-11	SHORT CHIP	0	
JR055	1-216-296-11	SHORT CHIP	0	
JR056	1-216-295-91	SHORT CHIP	0	
JR057	1-216-295-91	SHORT CHIP	0	

Ref. No.	Part No.	Description			Remarks
		< TRANSISTOR >			
Q001	8-729-027-43	TRANSISTOR DTC114EKA-T146			
Q002	8-729-010-05	TRANSISTOR MSB709-RT1			
		< RESISTOR >			
R002	1-216-817-11	METAL CHIP	470	5%	1/10W
R004	1-216-811-11	METAL CHIP	150	5%	1/10W
R005	1-216-825-11	METAL CHIP	2.2K	5%	1/10W
R012	1-216-825-11	METAL CHIP	2.2K	5%	1/10W
R013	1-216-825-11	METAL CHIP	2.2K	5%	1/10W
R014	1-216-827-11	METAL CHIP	3.3K	5%	1/10W
R015	1-216-830-11	METAL CHIP	5.6K	5%	1/10W
R016	1-216-832-11	METAL CHIP	8.2K	5%	1/10W
R017	1-216-837-11	METAL CHIP	22K	5%	1/10W
R022	1-216-825-11	METAL CHIP	2.2K	5%	1/10W
R023	1-216-825-11	METAL CHIP	2.2K	5%	1/10W
R024	1-216-827-11	METAL CHIP	3.3K	5%	1/10W
R025	1-216-830-11	METAL CHIP	5.6K	5%	1/10W
R026	1-216-832-11	METAL CHIP	8.2K	5%	1/10W
R027	1-216-837-11	METAL CHIP	22K	5%	1/10W
R032	1-216-825-11	METAL CHIP	2.2K	5%	1/10W
R033	1-216-825-11	METAL CHIP	2.2K	5%	1/10W
R034	1-216-827-11	METAL CHIP	3.3K	5%	1/10W
R035	1-216-830-11	METAL CHIP	5.6K	5%	1/10W
R036	1-216-832-11	METAL CHIP	8.2K	5%	1/10W
R037	1-216-837-11	METAL CHIP	22K	5%	1/10W
R042	1-216-825-11	METAL CHIP	2.2K	5%	1/10W
R043	1-216-825-11	METAL CHIP	2.2K	5%	1/10W
R044	1-216-827-11	METAL CHIP	3.3K	5%	1/10W
R051	1-216-864-11	SHORT CHIP	0		
R053	1-216-825-11	METAL CHIP	2.2K	5%	1/10W
R054	1-216-829-11	METAL CHIP	4.7K	5%	1/10W
R055	1-216-864-11	SHORT CHIP	0		
R061	1-216-864-11	SHORT CHIP	0		
		< SWITCH >			
S012	1-771-798-21	SWITCH, TACT			
S013	1-771-798-21	SWITCH, TACT			
S014	1-771-798-21	SWITCH, TACT			
S015	1-771-798-21	SWITCH, TACT			
S016	1-771-798-21	SWITCH, TACT			
S017	1-771-798-21	SWITCH, TACT			
S021	1-771-798-21	SWITCH, TACT			
S022	1-771-798-21	SWITCH, TACT			
S023	1-771-798-21	SWITCH, TACT			
S024	1-771-798-21	SWITCH, TACT			
S025	1-771-798-21	SWITCH, TACT			
S026	1-771-798-21	SWITCH, TACT			
S027	1-771-798-21	SWITCH, TACT			
S036	1-771-798-21	SWITCH, TACT			
S037	1-771-798-21	SWITCH, TACT			
S041	1-771-798-21	SWITCH, TACT			
S042	1-771-798-21	SWITCH, TACT			
S043	1-771-798-21	SWITCH, TACT			
S044	1-771-798-21	SWITCH, TACT			

EPG-001

Ref. No.	Part No.	Description			Remarks
	A-1077-069-A	EPG-001 BOARD COMPL			
		**********			
			(REF.NO.;50,000 SERIES)		
		< CAPACITOR >			
C101	1-162-912-11	CERAMIC CHIP	7PF	0.5PF	50V
C102	1-162-912-11	CERAMIC CHIP	7PF	0.5PF	50V
C103	1-100-566-91	CERAMIC CHIP	0.1uF	10%	25V
C105	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C106	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C107	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C108	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C109	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C110	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C111	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C112	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C113	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C115	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C116	1-126-205-11	ELECT CHIP	47uF	20%	6.3V
C117	1-100-363-11	ELECT	220uF	20%	4V
C201	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C202	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C203	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C204	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C205	1-100-566-91	CERAMIC CHIP	0.1uF	10%	25V
C206	1-126-205-11	ELECT CHIP	47uF	20%	6.3V
C207	1-124-779-00	ELECT CHIP	10uF	20%	16V
C208	1-124-779-00	ELECT CHIP	10uF	20%	16V
C209	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C210	1-124-779-00	ELECT CHIP	10uF	20%	16V
C211	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C212	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C213	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C214	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C215	1-100-566-91	CERAMIC CHIP	0.1uF	10%	25V
C216	1-126-205-11	ELECT CHIP	47uF	20%	6.3V
C217	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C219	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C220	1-100-566-91	CERAMIC CHIP	0.1uF	10%	25V
C221	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C222	1-162-927-11	CERAMIC CHIP	100PF	5%	50V
C223	1-162-927-11	CERAMIC CHIP	100PF	5%	50V
C301	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C302	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C303	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C304	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C305	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C306	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C307	1-126-205-11	ELECT CHIP	47uF	20%	6.3V
C308	1-126-205-11	ELECT CHIP	47uF	20%	6.3V
C309	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C310	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C311	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C312	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C401	1-164-739-11	CERAMIC CHIP	560PF	5%	50V
C402	1-124-779-00	ELECT CHIP	10uF	20%	16V
C405	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C407	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C408	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C502	1-100-566-91	CERAMIC CHIP	0.1uF	10%	25V

Ref. No.	Part No.	Description			Remarks
C504	1-100-566-91	CERAMIC CHIP	0.1uF	10%	25V
C505	1-100-566-91	CERAMIC CHIP	0.1uF	10%	25V
C506	1-100-566-91	CERAMIC CHIP	0.1uF	10%	25V
C507	1-100-566-91	CERAMIC CHIP	0.1uF	10%	25V
C508	1-100-566-91	CERAMIC CHIP	0.1uF	10%	25V
C509	1-100-566-91	CERAMIC CHIP	0.1uF	10%	25V
C511	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C512	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C513	1-124-779-00	ELECT CHIP	10uF	20%	16V
C514	1-124-779-00	ELECT CHIP	10uF	20%	16V
C515	1-124-779-00	ELECT CHIP	10uF	20%	16V
C516	1-124-779-00	ELECT CHIP	10uF	20%	16V
C517	1-124-779-00	ELECT CHIP	10uF	20%	16V
C519	1-124-779-00	ELECT CHIP	10uF	20%	16V
C520	1-124-779-00	ELECT CHIP	10uF	20%	16V
C521	1-124-779-00	ELECT CHIP	10uF	20%	16V
C522	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C523	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C525	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C526	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C527	1-124-779-00	ELECT CHIP	10uF	20%	16V
C528	1-107-826-11	CERAMIC CHIP	0.1uF	10.00%	16V
C529	1-124-779-00	ELECT CHIP	10uF	20%	16V
C530	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C531	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C532	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C533	1-124-779-00	ELECT CHIP	10uF	20%	16V
C534	1-124-779-00	ELECT CHIP	10uF	20%	16V
C535	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C536	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C537	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C538	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C540	1-165-708-11	ELECT	47uF	20%	6.3V
C541	1-165-708-11	ELECT	47uF	20%	6.3V
C542	1-165-708-11	ELECT	47uF	20%	6.3V
C543	1-165-708-11	ELECT	47uF	20%	6.3V
C544	1-165-708-11	ELECT	47uF	20%	6.3V
C545	1-107-826-11	CERAMIC CHIP	0.1uF	10.00%	16V
C546	1-107-826-11	CERAMIC CHIP	0.1uF	10.00%	16V
C602	1-126-204-11	ELECT CHIP	47uF	20.00%	16V
C603	1-126-204-11	ELECT CHIP	47uF	20.00%	16V
C604	1-126-205-11	ELECT CHIP	47uF	20.00%	6.3V
C606	1-162-927-11	CERAMIC CHIP	100PF	5.00%	50V
C607	1-162-927-11	CERAMIC CHIP	100PF	5.00%	50V
C703	1-137-765-21	ELECT	47uF	20%	16V
C707	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C711	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C715	1-137-765-21	ELECT	47uF	20%	16V
C717	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C718	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C719	1-165-708-11	ELECT	47uF	20%	6.3V
C720	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C721	1-165-708-11	ELECT	47uF	20%	6.3V
		< CONNECTOR >			
CN602	1-778-274-11	CONNECTOR, FFC/FPC 13P			
CN604	1-778-274-11	CONNECTOR, FFC/FPC 13P			
CN605	1-774-769-11	CONNECTOR, FFC/FPC 25P			
CN606	1-774-769-11	CONNECTOR, FFC/FPC 25P			
CN607	1-580-756-21	PIN, CONNECTOR (SMD) 7P			

Ref. No.	Part No.	Description			Remarks
* CN608	1-569-775-21	PIN, CONNECTOR (SMD) 5P			
		< IC >			
IC101	6-706-931-01	IC F741779APGEG4			
IC102	8-759-466-55	IC 74LCX74MTCX			
IC103	6-804-806-01	IC PIC12F629T-I/SNG-E01			
IC201	6-706-932-01	IC AD55/136-0Z(ADV7201)			
IC301	6-705-929-01	IC K4S641632H-UC75T			
IC302	NOT SUPPLIED	IC MX29LV160BBTC-90G			
IC401	8-759-344-12	IC GS4981CTA			
IC402	8-759-031-84	IC SC7S04F			
IC501	6-706-929-01	IC TA1287FG(EL)			
IC502	6-706-930-01	IC BH7236AF-E2			
IC503	6-707-120-01	IC NJM2284V(TE2)			
IC504	8-749-016-25	IC NJM2286V(TE2)			
IC703	8-759-460-79	IC BA09FP-E2			
IC705	6-703-755-01	IC PQ1L183M2SPQ			
		< COIL >			
L201	1-419-875-21	INDUCTOR	6uH		
L202	1-410-384-31	INDUCTOR	18uH		
		< TRANSISTOR >			
Q001	8-729-010-25	TRANSISTOR MSD601-RT1			
Q201	8-729-010-05	TRANSISTOR MSB709-RT1			
Q202	8-729-010-05	TRANSISTOR MSB709-RT1			
Q203	8-729-010-05	TRANSISTOR MSB709-RT1			
Q403	8-729-010-25	TRANSISTOR MSD601-RT1			
Q404	8-729-010-25	TRANSISTOR MSD601-RT1			
Q406	8-729-010-05	TRANSISTOR MSB709-RT1			
Q501	8-729-010-05	TRANSISTOR MSB709-RT1			
Q502	8-729-010-05	TRANSISTOR MSB709-RT1			
Q503	8-729-010-05	TRANSISTOR MSB709-RT1			
Q504	8-729-010-05	TRANSISTOR MSB709-RT1			
Q505	8-729-010-05	TRANSISTOR MSB709-RT1			
Q506	8-729-010-05	TRANSISTOR MSB709-RT1			
Q701	8-729-010-25	TRANSISTOR MSD601-RT1			
Q702	8-729-045-17	TRANSISTOR 2SB1561T100Q			
		< RESISTOR >			
R101	1-216-833-11	METAL CHIP	10K	5%	1/10W
R102	1-216-833-11	METAL CHIP	10K	5%	1/10W
R103	1-216-821-11	METAL CHIP	1K	5%	1/10W
R104	1-216-821-11	METAL CHIP	1K	5%	1/10W
R105	1-216-821-11	METAL CHIP	1K	5%	1/10W
R106	1-216-821-11	METAL CHIP	1K	5%	1/10W
R107	1-216-821-11	METAL CHIP	1K	5%	1/10W
R108	1-216-833-11	METAL CHIP	10K	5%	1/10W
R109	1-216-821-11	METAL CHIP	1K	5%	1/10W
R110	1-216-829-11	METAL CHIP	4.7K	5%	1/10W
R111	1-216-864-11	SHORT CHIP	0		
R113	1-216-833-11	METAL CHIP	10K	5%	1/10W
R114	1-216-833-11	METAL CHIP	10K	5%	1/10W
R115	1-216-864-11	SHORT CHIP	0		
R116	1-216-864-11	SHORT CHIP	0		
R117	1-216-864-11	SHORT CHIP	0		
R118	1-216-864-11	SHORT CHIP	0		
R119	1-216-864-11	SHORT CHIP	0		
R120	1-216-845-11	METAL CHIP	100K	5%	1/10W
R121	1-216-845-11	METAL CHIP	100K	5%	1/10W
R122	1-216-845-11	METAL CHIP	100K	5%	1/10W
R123	1-216-845-11	METAL CHIP	100K	5%	1/10W
R124	1-216-864-11	SHORT CHIP	0		
R134	1-216-864-11	SHORT CHIP	0		
R135	1-216-801-11	METAL CHIP	22	5%	1/10W
R136	1-216-295-91	SHORT CHIP	0		
R137	1-216-295-91	SHORT CHIP	0		
R138	1-216-295-91	SHORT CHIP	0		
R203	1-218-288-11	METAL CHIP	300	5%	1/10W
R204	1-216-822-11	METAL CHIP	1.2K	5%	1/10W
R206	1-216-833-11	METAL CHIP	10K	5%	1/10W
R207	1-218-288-11	METAL CHIP	300	5%	1/10W
R208	1-218-288-11	METAL CHIP	300	5%	1/10W
R209	1-218-288-11	METAL CHIP	300	5%	1/10W
R210	1-218-288-11	METAL CHIP	300	5%	1/10W
R211	1-218-834-11	METAL CHIP	300	0.5%	1/10W
R212	1-218-834-11	METAL CHIP	300	0.5%	1/10W
R213	1-218-834-11	METAL CHIP	300	0.5%	1/10W
R214	1-216-809-11	METAL CHIP	100	5%	1/10W
R215	1-216-809-11	METAL CHIP	100	5%	1/10W
R216	1-216-809-11	METAL CHIP	100	5%	1/10W
R217	1-216-829-11	METAL CHIP	4.7K	5%	1/10W
R218	1-216-829-11	METAL CHIP	4.7K	5%	1/10W
R219	1-216-829-11	METAL CHIP	4.7K	5%	1/10W
R220	1-216-864-11	SHORT CHIP	0		
R221	1-216-864-11	SHORT CHIP	0		
R222	1-216-864-11	SHORT CHIP	0		
R223	1-216-864-11	SHORT CHIP	0		
R301	1-216-864-11	SHORT CHIP	0		
R302	1-216-864-11	SHORT CHIP	0		
R303	1-216-864-11	SHORT CHIP	0		
R304	1-216-295-91	SHORT CHIP	0		
R401	1-216-810-11	METAL CHIP	120	5%	1/10W
R402	1-216-851-11	METAL CHIP	330K	5%	1/10W
R403	1-216-829-11	METAL CHIP	4.7K	5%	1/10W
R405	1-216-813-11	METAL CHIP	220	5%	1/10W
R406	1-216-813-11	METAL CHIP	220	5%	1/10W
R408	1-216-837-11	METAL CHIP	22K	5%	1/10W
R409	1-216-835-11	METAL CHIP	15K	5%	1/10W
R411	1-216-835-11	METAL CHIP	15K	5%	1/10W
R412	1-216-837-11	METAL CHIP	22K	5%	1/10W
R414	1-216-841-11	METAL CHIP	47K	5%	1/10W
R415	1-218-915-11	METAL CHIP	680K	0.5%	1/10W
R416	1-218-915-11	METAL CHIP	680K	0.5%	1/10W
R417	1-216-841-11	METAL CHIP	47K	5%	1/10W
R418	1-216-825-11	METAL CHIP	2.2K	5%	1/10W
R419	1-216-835-11	METAL CHIP	15K	5%	1/10W
R420	1-216-845-11	METAL CHIP	100K	5%	1/10W
R424	1-216-813-11	METAL CHIP	220	5%	1/10W
R426	1-216-864-11	SHORT CHIP	0		
R428	1-216-821-11	METAL CHIP	1K	5%	1/10W
R429	1-216-821-11	METAL CHIP	1K	5%	1/10W
R430	1-216-833-11	METAL CHIP	10K	5%	1/10W
R431	1-216-845-11	METAL CHIP	100K	5%	1/10W
R502	1-216-833-11	METAL CHIP	10K	5%	1/10W
R504	1-216-857-11	METAL CHIP	1M	5%	1/10W
R505	1-216-857-11	METAL CHIP	1M	5%	1/10W
R506	1-216-857-11	METAL CHIP	1M	5%	1/10W
R507	1-216-857-11	METAL CHIP	1M	5%	1/10W
R508	1-216-825-11	METAL CHIP	2.2K	5%	1/10W

EPG-001 CN-199 POWER BLOCK

Ref. No.	Part No.	Description			Remarks
R509	1-216-825-11	METAL CHIP	2.2K	5%	1/10W
R510	1-216-825-11	METAL CHIP	2.2K	5%	1/10W
R511	1-216-857-11	METAL CHIP	1M	5%	1/10W
R512	1-216-857-11	METAL CHIP	1M	5%	1/10W
R513	1-216-864-11	SHORT CHIP	0		
R514	1-216-825-11	METAL CHIP	2.2K	5%	1/10W
R515	1-216-825-11	METAL CHIP	2.2K	5%	1/10W
R516	1-216-837-11	METAL CHIP	22K	5%	1/10W
R517	1-216-829-11	METAL CHIP	4.7K	5%	1/10W
R518	1-216-841-11	METAL CHIP	47K	5%	1/10W
R519	1-218-867-11	METAL CHIP	6.8K	0.5%	1/10W
R520	1-216-833-11	METAL CHIP	10K	5%	1/10W
R521	1-216-833-11	METAL CHIP	10K	5%	1/10W
R522	1-216-864-11	SHORT CHIP	0		
R523	1-216-857-11	METAL CHIP	1M	5%	1/10W
R524	1-216-857-11	METAL CHIP	1M	5%	1/10W
R525	1-216-864-11	SHORT CHIP	0		
R526	1-216-857-11	METAL CHIP	1M	5%	1/10W
R527	1-216-833-11	METAL CHIP	10K	5%	1/10W
R528	1-216-833-11	METAL CHIP	10K	5%	1/10W
R529	1-216-833-11	METAL CHIP	10K	5%	1/10W
R530	1-216-833-11	METAL CHIP	10K	5%	1/10W
R531	1-216-809-11	METAL CHIP	100	5%	1/10W
R532	1-216-829-11	METAL CHIP	4.7K	5%	1/10W
R533	1-216-809-11	METAL CHIP	100	5%	1/10W
R534	1-216-809-11	METAL CHIP	100	5%	1/10W
R535	1-216-809-11	METAL CHIP	100	5%	1/10W
R536	1-216-809-11	METAL CHIP	100	5%	1/10W
R537	1-216-829-11	METAL CHIP	4.7K	5%	1/10W
R538	1-216-829-11	METAL CHIP	4.7K	5%	1/10W
R539	1-216-829-11	METAL CHIP	4.7K	5%	1/10W
R540	1-216-809-11	METAL CHIP	100	5%	1/10W
R541	1-216-829-11	METAL CHIP	4.7K	5%	1/10W
R542	1-216-829-11	METAL CHIP	4.7K	5%	1/10W
R549	1-216-845-11	METAL CHIP	100K	5%	1/10W
R560	1-216-827-11	METAL CHIP	3.3K	5%	1/10W
R561	1-216-827-11	METAL CHIP	3.3K	5%	1/10W
R562	1-216-827-11	METAL CHIP	3.3K	5%	1/10W
R563	1-216-833-11	METAL CHIP	10K	5%	1/10W
R564	1-216-833-11	METAL CHIP	10K	5%	1/10W
R565	1-216-295-91	SHORT CHIP	0		
R566	1-216-295-91	SHORT CHIP	0		
R567	1-216-857-11	METAL CHIP	1M	5%	1/10W
R568	1-216-857-11	METAL CHIP	1M	5%	1/10W
R603	1-216-811-11	METAL CHIP	150	5%	1/10W
R604	1-216-811-11	METAL CHIP	150	5%	1/10W
R605	1-216-864-11	SHORT CHIP	0		
R606	1-216-864-11	SHORT CHIP	0		
R607	1-216-864-11	SHORT CHIP	0		
R608	1-216-840-11	METAL CHIP	39K	5%	1/10W
R609	1-216-837-11	METAL CHIP	22K	5%	1/10W
R610	1-216-809-11	METAL CHIP	100	5%	1/10W
R611	1-216-809-11	METAL CHIP	100	5%	1/10W
R616	1-216-825-11	METAL CHIP	2.2K	5%	1/10W
R617	1-216-825-11	METAL CHIP	2.2K	5%	1/10W
R618	1-216-864-11	SHORT CHIP	0		
R619	1-216-864-11	SHORT CHIP	0		
R620	1-216-864-11	SHORT CHIP	0		
R621	1-216-864-11	SHORT CHIP	0		
R622	1-216-864-11	SHORT CHIP	0		

Ref. No.	Part No.	Description			Remarks
R623	1-216-818-11	METAL CHIP	560	5%	1/10W
R624	1-216-864-11	SHORT CHIP	0		
R625	1-216-864-11	SHORT CHIP	0		
R626	1-216-864-11	SHORT CHIP	0		
R627	1-216-295-91	SHORT CHIP	0		
R628	1-216-864-11	SHORT CHIP	0		
R629	1-216-833-11	METAL CHIP	10K	5%	1/10W
R630	1-216-833-11	METAL CHIP	10K	5%	1/10W
R722	1-216-833-11	METAL CHIP	10K	5%	1/10W
R723	1-216-833-11	METAL CHIP	10K	5%	1/10W
R724	1-216-833-11	METAL CHIP	10K	5%	1/10W
R725	1-216-833-11	METAL CHIP	10K	5%	1/10W
		< VARIABLE RESISTOR >			
RV001	1-223-583-41	RES, ADJ, CARBON (3 TYPE) 1K			
		< SWITCH >			
S601	1-572-474-11	SWITCH, TACTILE			
S603	1-692-270-41	SWITCH, SLIDE			
		< VIBRATOR >			
X101	1-813-259-11	VIBRATOR, CRYSTAL 12MHZ			
X501	1-813-438-21	OSCILLATOR, CRYSTAL			
		CN-199 (M) BOARD COMPL(NOT SUPPLIED)			
		**********			
		< CONNECTOR >			
CN1801	1-818-021-11	PIN, CONNECTOR 40P			
⚠	1-468-842-11	POWER BLOCK			
		**********			
		< CAPACITOR >			
⚠C101	1-104-705-11	CAPACITOR	0.1uF	400V	
⚠C102	1-104-705-11	CAPACITOR	150uF	400V	
⚠C103		CERAMIC	100PF		
⚠C104		CERAMIC	100PF		
C105	9-885-065-10	CAPACITOR	150uF	400V	
⚠C112		CERAMIC	1000PF		
		< CONNECTOR >			
⚠CN101	9-885-065-11	INLET, AC			
CN3	1-778-318-21	CONNECTOR			
		< DIODE >			
D101	8-719-075-34	DIODE 1N4005L			
D102	8-719-075-34	DIODE 1N4005L			
D103	8-719-075-34	DIODE 1N4005L			
D104	8-719-075-34	DIODE 1N4005L			
D105	9-885-064-90	DIODE SARS01			

Note :
The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

Note :
Les composants identifiés par une marque ⚠ sont critiques pour la sécurité.
Ne les remplacer que par une pièce portant le numéro spécifié.

Ref. No.	Part No.	Description	Remarks
D106	8-719-061-02	DIODE PR1003	
D107	8-719-901-33	DIODE 1SS33	
D108	8-719-901-33	DIODE 1SS33	
D109	8-719-901-33	DIODE 1SS33	
D301	9-885-064-97	DIODE S3L20U	
D303	8-719-921-20	DIODE 1SS119	
D304	8-719-921-20	DIODE 1SS119	
D451	8-719-921-20	DIODE 1SS119	
D452	8-719-921-20	DIODE 1SS119	
D601	8-719-210-21	DIODE 11EQS04	
		< FUSE >	
⚠F101	9-885-064-94	FUSE (SST) T3.15A/250V	
		< IC >	
IC101	9-885-065-07	IC STRW6852N	
IC301	8-759-632-07	IC M5237ML	
IC401	8-759-007-33	IC TL431CLP	
IC501			
		< COIL >	
⚠L101	9-885-065-09	LINE FILTER, LINE	
⚠L102	9-885-065-09	LINE FILTER, LINE	
		< IC LINK >	
⚠P301	9-885-065-02	FUSE (20N1000) 1A	
⚠P601	9-885-065-02	FUSE (20N1000) 1A	
⚠P401	9-885-065-03	FUSE (20N2000) 2A	
⚠P501	9-885-065-04	FUSE (20N2500) 2.5A	
		< PHOTO COUPLER >	
PC101	9-885-064-91	PHOTO COUPLER PS2561AL1	
		< TRANSISTOR >	
Q301	9-885-064-99	TRANSISTOR 2SJ525	
Q303	9-885-065-00	TRANSISTOR 2SJ438	
Q451	8-729-901-81	TRANSISTOR 2SC2412	
Q501	9-885-065-01	TRANSISTOR 2SK3754	
		< TRANSFORMER >	
⚠T101	9-885-065-08	TRANSFORMER, POWER	
		< VARISTOR >	
⚠Z101	9-885-064-93	VARISTOR S10K300	

Ref. No.	Part No.	Description	Remarks
		ACCESSORIES	
		**********	
	1-751-271-71	CORD, CONNECTION (AV)	
	1-759-586-21	CONTROLER, VIDEO	
	1-765-635-71	CORD, CONNECTION (NTSC)	
⚠	1-823-701-11	CORD, POWER	
	2-187-189-11	MANUAL, INSTRUCTION(ENGLISH)	
	2-187-189-21	MANUAL, INSTRUCTION(FRENCH)	
	2-187-190-11	GUIDE, QUICK START(ENGLISH)	
	2-187-190-21	GUIDE, QUICK START(FRENCH)	

Note :
The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

Note :
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Ne les remplacer que par une pièce portant le numéro spécifié.

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